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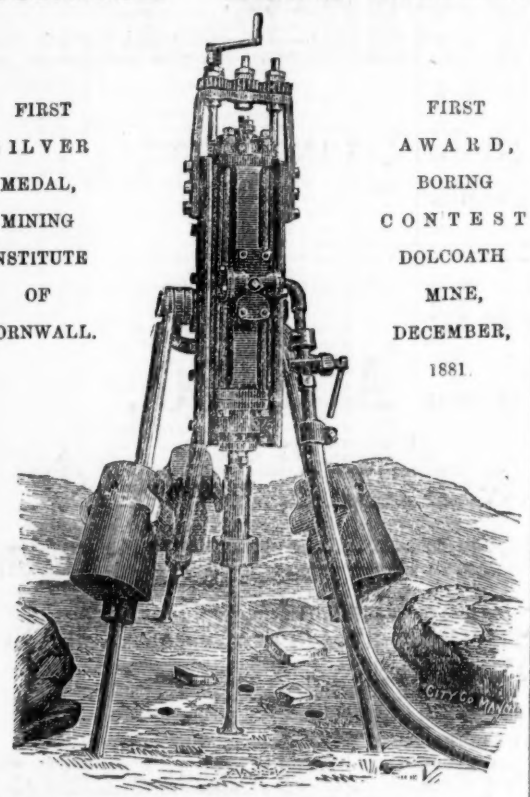

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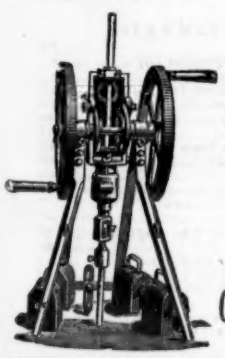

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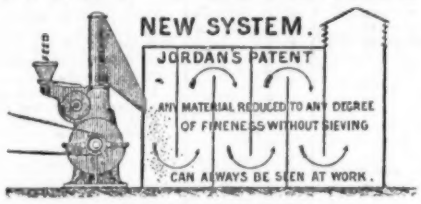

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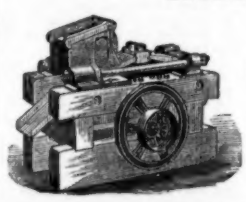

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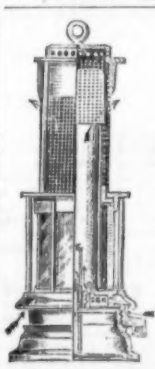

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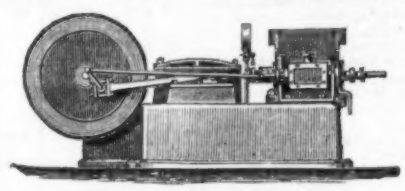

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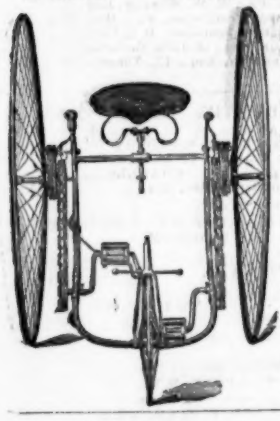

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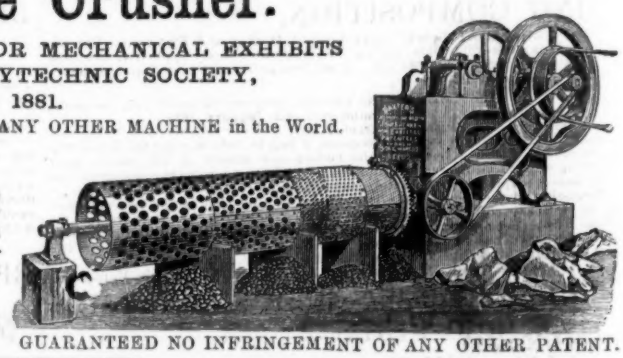

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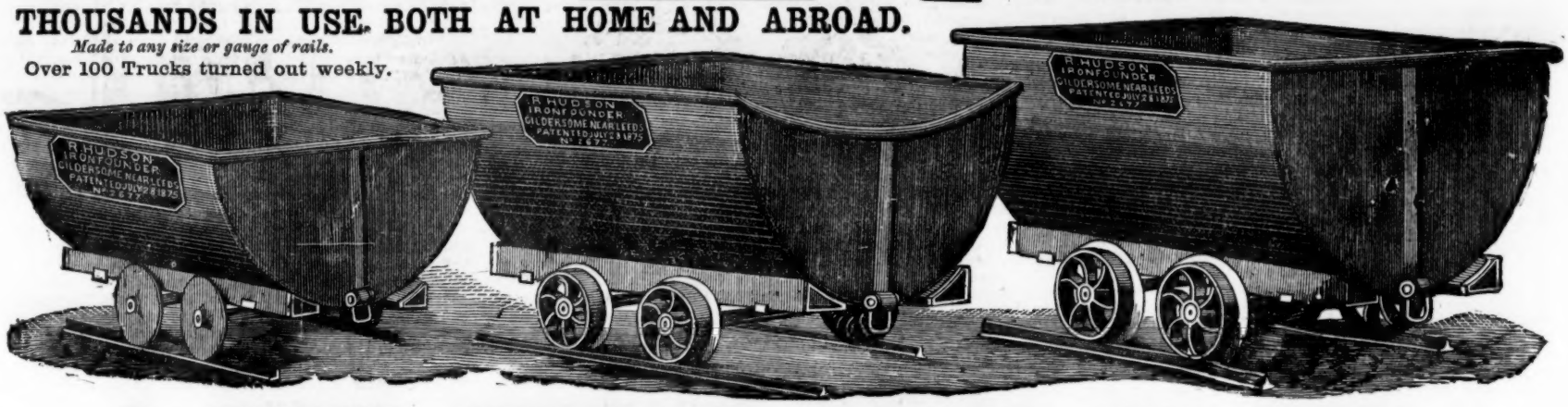

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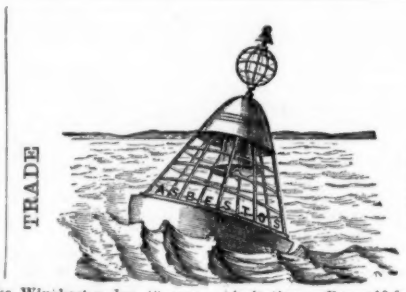

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"Herberton Advertiser" Office, Herberton, September, 1882.

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THE VIENNA ELECTRICAL EXHIBITION.

As is invariably the case in the early days of international exhibitions, the Electrical Exhibition at Vienna is still far from complete, although the managing committee have exerted themselves to the utmost, and have been hurrying up exhibitors most energetically. The opening really dates from last Thursday (Aug. 23), for until the evening of that day it was an electrical exhibition without electricity, and in almost absolute darkness. The boilers were not supplied, and it is doubted whether, when those being put in are complete, there will be enough steam for the machines. The rehearsal lighting on Wednesday was anything but a success, but on the opening night things went better. The Schückert dynamo was noticed in the *Mining Journal*, when reference was made to the Gülcher Light exhibition at Messrs. Ransome's Works at Chelsea, and it equally maintains its stand at Vienna. In the upper gallery of the Rotunda there are 40 arc lamps by Schwerd and Schückert and others. The Schückert lamps are the same as the Pilsen, and the Schückert machines being very excellent the lights produced are excellent. The Schwerd lamps are also good; they are constructed with the greatest mechanical ingenuity, the regulating apparatus for keeping the carbon points steadily at the same distance apart being very ingenious. In spite of this complication it is found less liable to get out of order than some other arrangements that are not so efficient in steadying the light. In all these lamps the principle of the regulating mechanism is the same. The electric current is divided into two streams through the lamp. The path of one of these offers a comparatively high resistance to its passage, and, therefore, only a small fraction of the current passes through it. The main current passes through the carbon pencils (which are usually round sticks about $\frac{3}{8}$ in. in diameter), leaping over the space left between the points of these two pencils above alluded to. This space is in ordinary working rather less than $\frac{1}{4}$ in. This gap in the circuit offers considerable resistance to the passage of the electric stream, so that it requires a certain difference of tension or "potential" to enable it to make the leap. If the gap becomes wider the resistance is increased, and, therefore, less of the current flows through this main circuit, and more is forced through the shunt. Now the wires of either one or both of the main and the shunt circuits are coiled round either one or two of the bobbins, which thus form electro-magnets. Through the hollow of the bobbin passes a moveable iron core, which is drawn inwards by the magnetism more or less, according to the strength of the current. In some lamps one of these iron cores is attached directly to one of the carbon pencils. When the current through the shunt is increased in consequence of the burning away of the carbons and of the resulting greater distance and resistance between their points, the movement of this iron core is such as to make the carbon points approach once more. In others the movement of the soft iron core actuates an escape lever so as to set in motion for a second or so a clockwork which accomplishes the same end—namely, the approach of the points. Since the unsteadiness of the light is caused by the variation of the length of the gap between the points, the above explained mechanism rectifies this unsteadiness. It must be observed, however, that this system of regulation—the only one as yet invented for arc lamps—is by no means a perfect one. The differences between different systems are due to a greater or less sensitiveness, that is, in one the change is made, the regulator comes into operation as soon as a very small percentage variation of light has occurred, whilst in others the movement occurs more tardily and a greater proportionate approach towards extinction is permitted before the regulator begins to move and correct the fault. In most modern lamps another shunt provides against accidents due to the increase of the current sent from the machine to a dangerous extent, whereby the lamp might be injured. In Schwerd's lamp an ingenious and very simple arrangement ensures the current its way through the lamp until the glass globe has been put on, and again the current is automatically shut off when the cleaning door in the side of the globe is opened, and turned on again when the door is shut. The Brush lights show up admirably, and the absence in them of that ghastly whiteness observable in some of the systems is rather an advantage than otherwise. The lamps in the first tier—70 or 80 arc lamps are furnished chiefly by the Anglo-Austrian or International Electric Company; but some are by Siemens and Halske, and most of the remainder by Piette and Krizik, a Hungarian company, which works the patent for the Pilsen lamp. The lamp is one of the simplest of the arc lamps.

Incandescent lamps form a prominent feature in the display, the great feature of novelty being the Bernstein lamp—an American invention—in which an extremely thin tubular carbon is used, giving a very large amount of surface in proportion to the material used and electrical resistance. The Bernstein lamp is agreeable to the eye, owing, it is said, to the large surface given to the carbon. The lamp is at present made in two sizes, one giving from 150 to 200 candle-power, the other from 200 to 300. The one requires only 25 volts and the other 50, according to the statement of the inventor. One peculiarity of the lamp is, that a return has been made in it to the system that has been frequently tried, and hitherto found impossible to carry out successfully—of having, instead of vacuum, a certain vapour inside the glass, which is said to prolong the endurance of the carbon, instead of destroying it. It remains to be seen whether this lamp will exhibit the endurance claimed for it by its author. The Commission will make careful tests of this and the other new lamps, and, until the results of these tests have become known, it is impossible to decide upon their respective merits. These big lamps will disabuse the public of a mistake they easily fall into—that incandescent electric lamps do not radiate any heat along with their light. One can very easily with the hand feel the heat thus radiated. This, however, does not prevent them having an enormous influence in keeping down the temperature of a room or hall and in keeping the air pure. As we have no combustion we have no heating and vibration of the atmosphere by the products of combustion. The Paris Edison Company exhibits a lamp of 100-candle power, the ordinary size used in London being 16-candle power. The difference is one merely of the dimensions of the strip of charred carbon through which the current passes, and which it heats to a high degree of brilliancy. The difficulties in the manufacture of the carbon strips are very great; but they have now been so far overcome that it is possible to produce these large and powerful lamps. A new large incandescent lamp is also exhibited by the representatives of the Swan Company. The carbon strip takes the same external form as the Edison, and is bent in one arc only. It is thicker and larger than the Edison. The essential and patented difference consists in the mode of manufacture. They are made in various sizes up to 200 candles. A French company, which carries out M. Gerard's inventions, has a lamp in which inside a large pear-shaped glass stand four straight filaments of carbonised straw joined at their extremities in two pairs, so as to make two circuits for the passage of the current. The intensity of the illumination has not yet been accurately measured; but the ordinary power of the lamp lies between 200 and 300 candles. To illuminate this, of course, a current of high electro-motive force is required, 60 volts being needed between the terminals of the lamp. Some attention has also been attracted by the Miller lamp, an improvement on the Swan, the carbon being much elongated; it gives about 50-candle power, and is a very agreeable light.

There are plenty of dynamos and secondary batteries, but there is nothing particularly new. The principal machine of this class is an alternating current dynamo, by Gauz and Co.; it is the largest machine in the Exhibition; it is combined with a vertical steam-engine for driving it, the two having one common shaft. It does a large amount of useful work throughout the Exhibition in feeding arc lamps. The incandescent lamps require a continuous current, and this is one of the reasons why the great majority of machines are now designed for this kind of current. Among the dynamos of special interest must be mentioned those of Siemens used on his electric railway and a pair to be used in a small launch which will run on the Danube Canal. The boat is 40 ft. long and 6 ft. beam, and accommodates about 40 people. Since conductors to lead the current from a stationary dynamo to the moving ship are impossible, the driving dynamo of this ship is fed by a battery of 80 accumulator cells, which are part of Messrs. Sellon and Volokmar's exhibit. Each of these 80 cells, if it were advisable to fully exhaust them, which it is not, would be capable of exerting one-horse power for the space of one hour. They are to be charged once a day by a dynamo fixed at a central station on the shore. The boat has been driven by this means at a speed of 11 knots per hour, but the speed intended to be usually kept up is eight knots. The Sellon-Volckmar Company also shows a tricycle to be driven by two or four cells similar to the above, but specially constructed with a view to compactness.

It is well known that the Faure-Sellon-Volckmar secondary battery, or accumulator, is made of perforated lead plates plastered over with minium, and dipped into boxes filled with dilute sulphuric acid. A German, Herr Kornblüh, makes almost identical cells, except that his layer of minium is of double the thickness that Volckmar uses. The original Planté cell, composed of plates of lead simply and the dilute acid, are also exhibited, as well as various modifications of it by Mr. Barrier, by the International Electric Company, and by the United States Electric Company, the patentee of whose cell is Mr. Kabath, of Paris. The design of this last shows very great mechanical ingenuity and skill. The object is to get as large a surface with as small a weight of lead as possible. The action of all these boxes is the peroxydation of lead, and it is well known that it is difficult, if not impossible, to make this oxydising action penetrate deep below the surface. The interior of the thick plates ordinarily used is wholly wasted, unless a very long time is spent in the "charging." Mr. Kabath has, therefore, built his up of extremely thin strips, about $\frac{3}{8}$ in. wide. There are about 190 of these laid one on the other in a pile $3\frac{3}{4}$ in. deep, and bound together by an envelope of thicker sheet lead. In order to allow access of the acid to all these surfaces every alternate small strip is corrugated, the corrugated or rippled surface being produced in rolling the sheets. This extremely ingenious design deserves success, and, according to the inventor, has already obtained it.

The telephones and microphones exhibited are very numerous, and some surprising feats have been performed with them. The most conclusive was that where a gentleman's singing and a lady's zither accompaniment thereto were distinctly audible though the singer and his accompanyist were 10 miles distant from each other, the one being 40 miles and the other 50 miles from the room in the Exhibition, in which they were being attentively listened to. Another feature is the electric-lighted cab, driven by Leopold Frank, who has the honour of being the first to introduce this kind of illumination into vehicles of this class. There is a model theatre lighted by electricity, but the object of exhibiting it is evidently to show its improved general construction.

THE PRECIOUS METALS OF NEW ZEALAND—No. II.

Westland is the most important gold-producing province in New Zealand, all being obtained from the beds of late tertiary or recent age. The gold has originally been derived most probably from leaders and veins in the beds of the Maitai (carboniferous) series, which constitute the neighbouring ranges. Enormous denudation has taken place, probably from glacial action, and the detritus has been carried to the bottoms of the valleys, and there spread out by the glacial rivers, the effect of which action would be to sluice the gold, and cause it to lodge principally in these river beds or bottoms. In some instances there would seem to have been a succession of such actions. At Ross there are six of these bottoms in a thickness of 400 ft. As glacial action ceased the rivers would begin to cut for themselves newer channels, the tendency of which would be to grow ever straighter and deeper, the accumulated deposits would be left in elevated terraces, and the bends and deviations of the older tortuous river beds would be cut off and left in these terraces. This is precisely how these leads are now found; the whole mass of gravels is sometimes auriferous in a small degree; but it is in the old beds of the rivers that the rich pay dirt is found. In many cases pits are sunk, as at Woodstock, where below 50 or 60 ft. of gravel is a pay bed from 2 to 10 ft. thick, yielding from 4 dwts. to 1 oz. to the load of dirt; this is mined and wound by a whip or windlass to the surface to be sluiced; claims thus worked are known as feeder claims. Often long and costly tunnels are driven to reach and drain these leads. At Waimea and Kumara the drift is auriferous for 60 ft. deep from the surface in what has evidently been a bend in the Teremakau river, the present channel of which is now 60 ft. below. In Humphrey's gully the wash dirt is 100 to 300 ft. thick, and auriferous throughout, and so at numerous other localities, the general features being very similar in all. The principal difficulty in working these high level terrace deposits has been want of water, and next to that the disposal of the immense mass of waste or tailings, but many miles of water races and tail races have been constructed, and hydraulicing and sluicing are now extensively and successfully carried on. The districts are Greymouth, Arnold, Ahaura, Waimea and Kumara, Kauieri and Hokitika, and Okarito, in none of which has quartz mining yet been established. In Greymouth, near Brunnerton, is the remarkable lode known as Langdon's, 9 ft. wide, 2 ft. of which is compact auriferous stibnite, the remainder being quartz carrying stibnite and a little gold. Near Kanieri is a well-defined reef, 10 ft. thick, and near Waimea several leaders from 1 to 5 ft. thick, the stone carrying visible gold. The district will probably become an important reefing one when the present alluvial workings begin to show signs of exhaustion.

Schistose rocks, which are believed to have been the original repository of the gold-bearing veins, constitute the solid geology of about half the province of Otago, but so great has been the glacial denudation which they have undergone that they are rarely seen at the surface, being hidden by the terraces and plains formed by resulting gravels and detritus. These gravels are almost always auriferous, though the gold is not uniformly disseminated throughout, some parts being richer than others. In some instances the gravels are compacted, and form cements requiring to be crushed to liberate the gold. In many cases the gravels have been washed, reassorted, and rearranged by the present rivers and streams, which follow a course differing from the ancient drainage system of the country, and the gold has been so concentrated as to form very rich deposits. These are the river and placer diggings, which since the discoveries of Gabriel Reed, in 1861, have yielded such fabulous riches, and the gold in these is often associated with platinum, zircons, garnets, black hematite, and scheelite. The province is divided into districts, which will be dealt with separately.

At Hindon, near Dunedin, the alluvial gold is almost exhausted. Several well-defined quartz reefs are known, and have been worked, but the yield was not considered satisfactory, and the mines are closed. Tuapeka, on the north of the Clutha river, contains chiefly allvial workings. The cements of this district lie in basins in the hollows of the older schists, and are often from 60 to 300 ft. thick, showing colour of gold throughout, but the payable parts being somewhat patchy. These have been tried by working the whole mass by hydraulicing and ground sluicing, and also by selecting the richer parts for battery treatment, but the results have not been satisfactory, and they are now almost abandoned. At Gabriel's Gully an attempt is being made to rework the immense deposits of tailings left from former earlier diggings, by sluicing on a large scale with Perry's hydraulic elevator, and should this turn out a success it will probably cause a revival in many districts now nearly abandoned. At Waipori are reefs yielding from 10 to 19 dwts. per ton, worked on a small scale. Waikaia is an alluvial district only.

The Oamaru and Mount Ida districts are chiefly alluvial, and most of the surface deposits show diminishing yields. Hydraulicing is followed in some cases, but the results are not very profitable. At Serpentine some reefs are being opened with encouraging prospects. The Dunstan and Wakatipu districts give employment to a large number of alluvial miners, the Clutha river throughout its course and its tributaries being all auriferous, though much of the easier worked ground is becoming exhausted. The bed of the Clutha is worked by floating dredges at many points, and in some cases with considerable profit; but the future prosperity of these districts will probably largely depend on the working of the reefs near Cromwell, Macetown, and Shotover. These are contained in laminated mica and clay schists, which form a broken and mountainous country, with valleys 3000 or 4000 ft. deep. At Macetown there are five or more well-defined reefs, bearing nearly north-west, and varying from 2 ft. to 14 ft. wide; the matrix is quartz and breccia, the quartz carrying free gold and auriferous pyrites in irregular shoots, richest where the pyrites are most abundant. The general yield has been from 1 oz. to 1½ oz. to the ton, though some of the leaders have given as much as 5 ozs., and 300 tons crushed by the Maryborough Company in 1881-2 yielded 4 ozs. per ton. So great is the elevation of this country that work cannot be carried on for at least five months in winter; and the want of roads is a great hindrance to the proper development of the mines. At Shotover there is a reef 12 ft. wide, which, however, has not yet proved very rich. At Longwood some alluvial mining is still carried on, and some reefs, not very well-defined, bearing north-west, intersect the slates, conglomerates, and breccias of the Longwood range, the gold being extremely patchy, and no very successful results have been attained so far.

All gold is alloyed with silver, and the degree to which this obtains varies greatly in New Zealand, alluvial being, as a rule, finer than reef gold. That from Otago is 22½ to 23 carats fine, equal to 92·57 to 95·98 per cent., while from the Thames Mr. Skey examined twelve samples, the results being gold from 43·2 to 60·6 per cent., and silver 56·8 to 39·4. Yet some alluvial gold from the latter district was 22 carats fine, or 91·66 per cent., the reason of which is not very apparent, unless we may suppose that the ore contains some silver which the mercury used in amalgamation picks up along with the gold. The gold from Otago, Westland, and S. W. Nelson is valued at 3*l*. 15s. to 3*l*. 17s. 3d. per ounce; from Collingwood and Marlborough, 3*l*. 10s. to 3*l*. 13s.; and from Auckland, 2*l*. 5s. to 3*l*. 3s. In prospectuses it is very common to give statements of the yield per ton of quartz, and from the analyses made at the Colonial Laboratory at Wellington many startling bits may be culled. As many credulous investors have had reason to learn, a few ounces or pounds of picked specimens no more make a valuable and paying mine than one swallow makes a summer. However, as curiosities in their way, the following may be cited:—Quartz from a lode at the Thames gave 1335 ozs. to a ton; a micaceous rock from Cromwell, 23 and 30 ozs.; iron pyrites from Dunedin, 70 ozs.; quartz from Lyell, 71 ozs. The average yields per ton for the three years to 1881 are—Auckland, 1 oz. 10 dwts. to 1 oz. 17 dwts.; West Coast, 13 to 16½ dwts.; Otago, 10 to 18½ dwts.; this compares very favourably with Victoria, where the average yield for six years from 1874 to 1880 was 10 dwts. In New South Wales in 1879 the average yield was 1 oz. 5 dwts. per ton.

The importance of the gold mining industry to this colony may be appreciated by the fact that from April, 1857, to June, 1882, the exports of gold have amounted to 9,910,210 ozs., of the value of 38,666,278*l*., an average per year of 1,531,337*l*. As to future prospects about two-thirds of the gold now produced in New Zealand are derived from alluvial deposits, but reefing is becoming more general, and certainly contains the elements of greater permanency than alluvial mining can be expected to afford. There is plenty of stone yet unworked, as rich as that which yields good results in Australia, but which dear labour and a difficult country prevent from being profitably worked at present. The great want is better means of communication to open up the country and facilitate transit, and so cheapen the present heavy costs of mining, and there can be no doubt that this would give a great impetus to an already very important industry, and render it the source of permanent benefit to the colony.

Although a notable quantity of SILVER is produced in New Zealand, it is all found either as an alloy with gold or in galena. Small fragments of native silver were obtained in the diggings at the head of Wakatipu Lake in 1864, and at Waipori, and the Colonial Museum contains a specimen of argentite which came from the Silver Crown claim at the Thames. A specimen procured from Grahamstown was an argentiferous ore associated with auriferous quartz, and by amalgamation gave 22 19-20 ozs. gold, alloyed with 70 ozs. silver, and a further 309 ozs. silver, which was probably in the state of a double sulphide of silver and lead. A vein of silver-lead occurs in Ohio Creek, Thames, and in a gully near the hot springs on the west face of Te Aroha Mountain is a known silver lode, but little has been done to prove its value.

In Collingwood, at Richmond Hill, there is the most important discovery of silver yet reported. In 1875 a sample from this place was sent to the Colonial laboratory to be examined as an iron ore, but proved to consist of sulphides of lead, antimony, copper, and iron, and gave 185 ozs. of silver to the ton. It was taken from a vein crossing the Parapara river, about five miles above its mouth. The country rock is gneissic schist, and the lode is from 20 in. to 2 ft. wide, carrying a rib of solid compact ore from 3 to 7 thick in a gangue of quartz, and some chalcopyrite, yielding 150 ozs. of silver to the ton. The centre rib is a new mineral, a variety of fahlerz or tetrahedrite, for which the name Richmondite has been proposed. It is of massive subcrystalline structure, brittle, cleavage irregular, color black or reddish, streak dark slate, H. 4·5; S.G. 4·317; fuses with intumescence at a little under red heat. Explorations were commenced which showed the lode to be well defined, but the ore was patchy, and in depth became a mixture of iron and lead sulphide, the galena giving from 21 to 163 ozs. of silver only, whereas the Richmondite had yielded from 100 to 1792 ozs. The results were not considered such as to warrant the commencement of systematic mining operations with any prospect of profit, and the works were closed, and at latest advices so they remain. Dr. Hector, writing in 1881, attributes the failure to the want of power drills.

In Westland, at Mount Rangitoto, 20 miles south of Hokitika, there is a lode 10 in. thick cropping on the face of the mountain at the junction of the granite and slate, and carrying pyrites and argentiferous galena. Considerable excitement was caused in the colony by the publication of assays of this ore, which stated the contents of silver to be 735 and 392 ozs. per ton, and on these a company was projected to buy and work the property. The colonial analyst, Mr. Skey, thereupon procured authentic samples from the lode, but could only obtain 43 and 45 ozs., and from subsequent samples only 7 to 28 ozs. These results were borne out by those of Prof. Bickerton, Christchurch; of Mr. Isaac Lewis, Westland; and of the Royal Laboratory, Harz Smelting Houses, Germany; and Mr. Skey deserves credit for having by his prompt and praiseworthy action in the matter saved the pockets of the investing public, and prevented a rude blow being inflicted on the legitimate development of Colonial mining.

12,500 LBS. BULLION PER DAY FROM A 30-TON SMELTER.

The copper smelter known as the Old Globe, now owned and operated by the Old Dominion Company, at Globe, Arizona, has probably made the most remarkable record as to product of any smelter ever run. It was started up some 10 months ago, and has been running ever since, except occasional delays for want of coke. In exact figures 226 days' run produced 2,824,200 lbs. bullion, an average of (say) 12,500 lbs. per day, running some 98 per cent. Though only rated as a 30-ton smelter it has handled regularly over 40 tons of ore per day. This is one of the Pacific Copper Smelters, made by Rankin, Brayton, and Co., of this city, and is another assurance, in addition to the many already given, of the positive and certain results attained by this system of smelting, and its great value, present and prospective, to our general mining interests.

—*San Francisco Mining Exchange.*

UNITED STATES ROLLING STOCKS COMPANY.—The half-yearly report, which was submitted to the shareholders in New York on Aug. 11, stated the gross earnings at $258,909, or an increase of $51,902, and the net income at $132,412, or an increase of $28,685. The net income, it was stated, admitted of the payment of a dividend of 10s. per share, but it was deemed advisable to pay an interim dividend of only 8s. per share.

PEARSON AND KNOWLES' COAL AND IRON COMPANY.—According to the report just issued, the net profits for the year ended June 30 amounted to 46,396*l*., exclusive of 5451*l*. brought forward. The interim dividend paid in March absorbed 15,715*l*., and the directors now propose the payment of the usual dividends at the rate of 6 per cent. per annum each on the A and B shares, both free of tax. They also recommend the transfer of 5000*l*. to the reserve fund, leaving 6257*l*. to be carried over. The coal trade, it is stated, remains unremunerative, and the iron trade is still from satisfactory.

Original Correspondence.

MINING IN MEXICO.

SIR,—Whether it is owing to the fact that negociations are opened with a view to re-establish friendly relations between Mexico and England, or that English capitalists wish greater returns from their capital, I do not know, but it is quite certain that the rich mineral districts of this country are at present attracting a great deal of attention in Europe, and especially in England, and judging from my personal experience after a residence of some years in this country I am positive that no country in the world offers such inducements for the profitable employment of capital as Mexico does at the present time. From time immemorial the rich silver lodes of this country have been wrought on to a greater or lesser extent, and yet up to the present comparatively little has been done towards developing the vast mineral resources of the country, it appearing to have been the maxim of the miners to work out the old before looking for any new mines, hence the Spaniards worked on the leavings of the Aztecs, and the Mexicans of the present generation are content to endeavour to exhaust the mines as left by the Spaniards. True the English spirit of exploration has during the last few years succeeded in opening up a few shafts in proximity to the rich mines of Mexican companies, but these are mere cyphers when the mineral wealth and extent of the country is taken into consideration; but even these undertakings, small as they are, have mostly been highly remunerative, and yet extensive mining concessions are lying idle for want of enterprise to develope them. Probably no State in this republic is so rich in mineral veins as this one (Hidalgo), silver, gold, copper, iron, lead, and coal being found in abundance, and at so comparatively shallow depth that little capital is necessary to develope the lodes. The writer is acquainted with many places available for mining setts, which are well worthy the attention of capitalists, which can be had on very easy terms. The mining laws of the country are very just, and the mineral rights being vested in the State Government, no dues are exacted till the mine is in a dividend state, and then 1-25th of the profits are paid as dues. The setts are generally granted for indefinite terms, subject to the due fulfillment of the code of mining laws and contract between lessors and lessees.

The climate of this part of the country is in general healthy after climatisation has been effected; the mean temperature for the year averages about 70° F., but the seasons are much the same throughout, the difference in the thermometer in the months of July and January (the hottest and coldest months) being about 11°, but owing to the extreme elevation from 8000 to 10,000 ft. above sea level the air is very rarified. The writer will forward copies of mining laws or other information on the subject for further publication.

Pachuca, Mexico, Aug. 7. ——— F. W. BAWDEN, M.E.

THE MINERAL DISTRICT OF CARACOLES—BOLIVIA—CHILI.

SIR,—I promised some time ago to give you some information on the silver mines of Caracoles, which may be interesting to some of your readers. This mineral district called Caracoles formerly belonging to the Republic of Bolivia, and now occupied by Chili, is situated in latitude 23° 4′, and longitude 69° W., Greenwich, 9600 ft. above the level of the sea, distant from the port of Artofagasta some 120 miles. A railway from the port to the nitrate fields (pampas) of the Artofagasta Company has a length of nearly 100 miles, and will shortly be prolonged to the interior, passing Caracoles at a minimum distance of 24 miles. This railway will pass through other mineral districts, abounding in both silver and copper, as well as fields of borate of lime, &c. Caracoles itself is composed of distinct groups, which have given large quantities of silver ore. The following general remarks can be applied to all the groups:—Like in Chanarcillo, the world-renowned silver district of Chili, the formation belongs to the Jurassic period, being chiefly grey and black limestones, with all the ammonites and ostrae peculiar to this formation; rarer species like Diceras Lonsdalii have also been found. The schists are now and then interstratified with a quartz porphyry. The ore deposits are found either in the limestone schists or in contact with the porphyry, but very rarely stretching very far into the latter, except in cases where the porphyry lies superficially over the limestone. This can be taken as a proof that the silver has been deposited by infiltration from the schists in the cracks occasioned by the eruption of the porphyry and later movements of the crust of the earth. In almost all the mines the deposits have the appearance of being superficial, as they rarely continue more than 150 metres in depth, even although the schists continue uninterrupted by eruptive rock. Some mines have given very good ore at the surface in the limestone, and the lodes have become completely sterile on passing a schist of porphyry which has by chance been injected between the strata, and proved productive again on re-entering the limestone. The lodes in all the groups except one have a common strike and dip running north and south, with some few degrees to the west, and dipping to the east. The Isla (Island) group forms the exception, the lodes having a run from east to west. Here also there are one or two very powerful cross lodes which at times throw the true ones. The ore is more abundantly the chloride of silver, hornsilver in its various forms; argentite and proustite, as also galena rich in silver are found more in depth, although at times they appear at the surface, showing that the decomposition into chlorides and carbonates was not at all times perfect. The chloride has also been found mixed with the arsenide, antimonide, and sulphide even at 150 metres in depth, and some very curious specimens have been found where they appear in concentric layers.

In the principal group we have the mine Deseada, which gave from 1871 to 1876 inclusive ... $7,660,000 gross, or $5,500,000 net profit.

The adjoining mines—Merceditas ...	$1,850,000	„
Flor del Desierto	720,000	„
Cautiva	480,000	„

In this group all the mines are measured on one lode, the Flor del Desierto being to the south of Deseada, and the Cautiva and Merceditas to the north. A very fine cross lode entered the principal lode in the ground of the Deseada, and at the junction the large pocket was found. The ore seems to lie in zones which have an inclination of about 30° to the south, so that the ore that has been found since 1876 in the Flor del Desierto Mine at a depth of 100 to 120 metres, which has given the net sum of $600,000, corresponds to the pocket at the surface of the Deseada. This zone is still further known in the Calameña Mine, which follows to the south of the Flor del Desierto. An arrangement was made between the owners of the above four mines to sink a shaft to ascertain whether any other deposit existed in the lode in depth, and solve the problem whether metallic deposits are really only caused by infiltration or do also originate from eruption. Up to the date the shaft of the Deseada has reached the vertical depth of 611 metres, passing through only a comparatively thin layer of limestone at 200 metres, and then entering porphyry. Long cross-cuts have proved that the lode on leaving the contact line of the porphyry with the schists has become very broken up, and continues in hairs and fingers of calcspar, with occasionally a little baryta. Traces of silver have been found in the form of sulphide at 400 metres and 450 metres depth, but on assaying, the mineral being so very disseminated, the ore only gave 8 marcs per cajon of 64 quintals, or about 0·06 per cent. of silver. At 195 metres depth a narrow lode gave some proustite (rosieler) and agentite, but notwithstanding various workings were made the origin of this small isolated pocket was not discovered. At 600 metres in the porphyry small veins of anthracite have been found reaching a thickness of 4 in. This anthracite appears either alone or mixed with calcspar and baryta, but without a vestige of metallic substance. As the lower limestone schists are very bituminous I think that this appearance of organic substance can only have its origin from the said shales. To show the nature of the ground I send to you illuminated plans of the mine, one a vertical plan of the Deseada shaft, showing more or less the strata cut, and another a succession of transversal plans of cuts across the lode at different points. I add a statement of the different temperatures taken at several points in the mine, which may be interesting to compare with other statistics I have seen in the *Mining Journal*. At present, besides continuing to sink the shaft, we are about to run a level at 600 metres depth to the south on the principal branch of the lode, and hope that by giving it a length of some 300 metres we may cut the zone corresponding to the pocket of ore found at 195 metres in depth. As the mine will probably change in depth, and as the present idea of the owners is to continue the shaft to a depth of 800 metres, some data given at a later date might also prove of interest to your readers. J. STEWART JACKSON.

Minas Descubridoras de Caracoles, Sept. 1.

[The table shows the temperature to have been—the figures in parentheses are the corresponding Fahrenheit degrees, the others being Centigrade—at surface, 13·3° (56°); at a depth of 15 metres, 13·6° (56½°); at 50 metres, 14·4° (58°); at 100 metres, 17·5° (63½°); at 140 metres, 18° (64½°); at 200 metres, 17·5° (63½°); at 256 metres, 20·5° (69°); at 300 metres, 18·2° (65°); at 350 metres at shaft, 19·2° (66½°); at same depth out of air current, 20·5° (69°); at 400 metres, 25° (77°); at 450 metres, 24° (75°); at 500 metres, 20·8° (69½°); at 550 metres, 25·3° (77½°); and at 590 metres, 27·7° (82°.) The table, which gives various details as to the temperature at intermediate depths, and under various conditions and at different distances from the shaft, is larger than our space will permit us to publish.]

THE MINERAL RESOURCES OF BUTTE, MONTANA, U.S.A.

SIR,—Of the minerals exhibited at the Denver National Mining and Industrial Exposition there are none more marked and characteristic of true copper and silver bearing fissure veins than those from Butte, Montana Territory. These were, in fact, so interesting that the writer paid particular attention to the examination of the ores and associated minerals from that locality. The statistical information respectively of the mines at present working, and other points of interest concerning the district were obtained through the courtesy of Commissioner J. B. Read, representative of the Montana Territory at the Denver Exposition. The notes on the mineral character of the ores are derived from the writer's inspection of the exhibit, which Mr. J. B. Read assures him constitutes in general a fair representation of the ores produced, which are either shipped to local mills and smelters or transported to the copper-silver works at Swansea, Wales.

The ores occur in fissure veins in a granite country traversed in places by porphyry dykes, which appear in most cases to have close connection with the mineral deposits. The granite is of the ordinary medium grained type, generally looked upon here as favourable for their good development. These lodes outcrop, and can generally be traced over long distances on the surface, the backs often rising above the surface of the surrounding country rock, which is generally covered with detritus, but little drift or alluvial detritus.

The lodes average from 10 to 12 ft. in width, some being occasionally much larger. The heavy pay streaks vary from 1 ft. to 4 ft. in width on an average; in some exceptional cases shoots of ore have contained as much as 40 ft. of solid ore. The backs of the lodes down to the water level are usually much decomposed, and are of true gossany character, which usually results from the decomposition of copper and silver ores occurring in a siliceous gangue The surface ore may be described as a porous quartz filled with oxidised ores, the copper principally as green carbonate, and the silver either in a free state or as a chloride; or, at other times again, as a chloride, intimately associated with the oxides of the base metals.

The copper is sometimes found as oxide, but generally in an amorphous form. Occasionally some iodide and bromide occur. One specimen in particular from the Phillipburg Mine, in Deer Lodge County, shows a very fine green incrustation of iodyrite, or iodide of silver on quartz vein stuff, filled with ruby and other sulphurous ores of silver. Other minerals that occur in the composed ore to depths of from 40 to 100 ft., are the oxides of manganese and iron—the former as a black variety, and the latter in the form of black, red, and yellow ochres. The minerals representing the normal or undecomposed ores are of a sulphurous composition, and according to locality and mine, may be either sulphide of copper or sulphide of copper and iron, and sulphide of silver, but when associated the silver often occurs in the native state in massive copper glance. The ores of copper are usually of the varieties known as copper glance in its massive state, and bornite or horseflesh ore, and carry from 40 to 60 per cent. of metallic copper. Copper pyrites are less common, however, and some occur in particular localities. Grey copper ore also occurs, but is not a very characteristic mineral.

In some of the mines there is but little copper, the principal ore being argentite or sulphide of silver in quartz. Red silver ores (pyrargyrite and proustile) occur in some places, but the sulphide is the most ordinary ore. In some cases development has shown the silver ore to be replaced entirely by copper glance, containing from about 20 to 50 ozs. of silver. Arsenic and antimony occur but sparingly; however, the copper ores in the Colusa contain from ½ to 1 per cent. of arsenic. Most of the copper and silver ores have a quartz matrix, with streaks of rhodonite, the silicate of manganese and rose red carbonate, rhodochrosite not being more intimately associated with the sulphide silver ores, and are useful for fluxing purposes.

The lodes are well defined with smooth walls lined with a flookan or clay gonge matter. Most of them are nearly vertical, and so far none of them have shown faulting. Most of the veins dip south at angles of from 60° to 70° with the exception of the Alice, which dips north. The heavy ore bodies occur in shoots coursing west, while the general strike of the lodes is east and west; the lower grade ore is disseminated throughout the vein, necessitating subsequent concentration.

The Butte ores may be divided into three classes, according to the treatment they require—1, smelting or matting; 2, concentrating and smelting; 3, chlordising and milling. The first is principally an argentiferous copper ore, carrying from 30 to 60 per cent. copper and 50 to 70 ozs. of silver; the second, from 5 to 20 per cent. of copper and 15 to 30 ozs. silver; the third class is a sulphurous and free milling surface ore, parcels varying in value from $30 to $200 in silver to the ton of 2000 lbs. The richer copper ores are shipped to Swansea, the next grade is turned into matte, and then shipped. The milling ores are amalgamated and turned into silver bullion on the spot. In most cases there is not much gold; it, however, occurs associated in paying quantities in some of the mines, frequently enhancing the value of the bullion or matte to a considerable extent.

So far, the mines have not been much troubled with water, direct acting steam-pumps having proved sufficient for the purpose, and up to the present time no heavy Cornish pumps have been needed, though one is operation on the Moulton Mine. There are some 4000 claims located; of these about 1300 are patented, that is, properties on which the owners have secured the United States Government title.

Amongst the most important at the present time are the following, each one described in brief:—Anaconda, owned by Messrs. Haggin and Tevis, the great California operators, who own the celebrated Homestake properties in the Black Hills. The ore is massive copper glance, containing native silver. The ledge is 40 ft. wide, the heavy ore occurring in shoots; here there is no rhodonite, only a quartz gangue. The mine has a capacity for producing 500 tons per day. It has not been stoped, and has over 5000 ft. of levels. The upper levels produced free milling silver ore in a honeycombed quartz. The shaft is being pushed rapidly forward down to the 1000 ft. level. The machinery is the finest of any mine on the Pacific Coast. A 400-horse power engine is used for hoisting, a 500 ton smelter, and a 250 ton concentrator are being erected. At present the ore is being shipped to Swansea, a 6000 ton contract being in hand. The same owners purchased the extension, called the St. Lawrence, which is developed to the extent of 500 ft. A year ago they paid $165,000 for it. The air compressor is the one built for the Sutro Tunnel. The lode courses east and west, and the ore averages 35 per cent. of copper. Before the year ends the Northern Pacific Railroad will be extended to the mine.

The Bell Mine, owned by the Bell Mining Company of New York, have just sunk a new shaft to a depth of 400 ft., where the vein was tapped. The mine was previously developed to a depth of 300 ft. The walls are well defined and have a clay lining. The ore is in part copper glance, and contains native silver and carries from 18 to 50 per cent. of copper, averaging about 30 per cent., and from $30 to $60 in silver. This mine contains some copper pyrites. The company have their own matting furnaces, the matte from which runs 60 to 80 per cent. of copper, and $60 to $80 in silver, and is shipped to Swansea for further treatment.

The Montana Copper Company own the Colusa Mine, which is developed to a depth of 400 ft. by a three-compartment shaft. One level at the 260-ft. station has attained a length of 800 ft., and shows a 22-ft. body of ore. The mine produces 100 tons of ore per day, running 25 per cent. copper, and from $15 to $40 of silver; 25 tons of matte is shipped per day, and during last year 8000 tons of ore and matte were shipped, the ore containing 40 per cent. copper and the matte 65 per cent. They have five matting furnaces and one blast—the latter of about 8 tons capacity. The smelter is connected with the railroad, and the mine is connected with it by tramway. Their other two claims—the Mountain and Gambetta—are not working, the Colusa being more than sufficient to supply their present plant, having at the present time a productive capacity of over 200 tons per day.

The Parrot, owned by a Connecticut company, is down 300 ft., and have from 8 to 12 ft. of ore running from 25 to 70 per cent. copper, and large bodies of concentrating ore. Their smelter has a capacity of 50 tons per day, and they are now increasing the size of their concentrating works to 60 tons. The works ship 12 tons of matte per day. This company in Connecticut use 12,000,000 lbs.—say, 6000 tons—of copper per annum. They, therefore, have use for their own copper.

The Boston and Colorado Smelting Company, who own large works in Denver, own half-a-dozen mines in Butte, but principally buy ore. Their works at Butte are a branch of the Denver Argo Works. The company have 10,000 tons of ore on hand ready to smelt, and their works at Butte of four stacks produce $1,000,000 per annum. Their matte runs 50 per cent. copper and $600 to $1500 silver, and is shipped to Argo by the Union Pacific Railroad.

The Liquidator is developed by a 200-ft. shaft, which shows 35 ft. of ore; the vein has a granite horse in the middle about 6 ft. through. The owners have made contracts for 4000 tons of second-class ore, and 500 tons of first-class, the former bearing 20 per cent. copper and the latter 40 per cent., and no silver at present. The mine could produce 100 tons per day were it required.

The Modoc is developed by a 200-ft. two-compartment shaft, and shows 8 ft. of 20 per cent. copper ore in both levels, the levels aggregating 500 ft. in length. This mine is in the same lode as the Bell, previously mentioned.

The Ramsdell Parrot is down 250 ft., and has a copper-silver ore body from 10 to 12 ft. in thickness.

The Gagnon, owned by Colonel Thornton, is developed by a three-compartment shaft, 500 ft. in depth, from which five levels are driven, and yields 40 tons per day. During the last three years the mine has yielded over $1,000,000 worth of ore, averaging $60 silver, 12 per cent. copper. The ore is shipped to the Boston and Colorado smelters. The pay-streak is from 5 to 9 ft. wide, and generally on the footwall. The upper levels still show a great deal of low grade ore, measuring up about 30,000 tons, which is worth $30 per ton, but from present high rates of production is not available as pay ore. The Original, which joins the Gagnon on the east, is developed by a 400 ft. incline, and has a pay-streak of from 3 to 8 ft. It is essentially silver ore containing some copper. The silver occurs as sulphide, and has paid a monthly dividend for the past 26 months of $3000 per month. The mine is equipped with a fine plant, and the ores are shipped to the Boston and Colorado smelters. The Lexington, owned by a French company, with head office at Paris, is developed by a 500 ft. shaft. The mine produces 60 tons of ore per day of milling character which requires chlorodising. It pulps $55, of which 5 per cent. is gold. There is enough ore in sight above the 400 ft. level to last two years. This estimate was made by Mr. A. Wartenweiler, the manager and superintendent. The first dividend of 1,000,000 frs. was paid on July 1 last. During the first six months of this year the bullion produced realised a value of $638,458. The company's mill consists of 60 stamps, 50 of which are running on ore and 10 on salt, all of which is dry crushed, the ore is calcined in two Stetefeldt furnaces.

The Moulton has a 500 ft. three-compartment perpendicular shaft in solid granite, the levels cross-cutting to the main ore shoots which are west of the shaft. This claim, which is 600 ft. by 1500 ft. contains three separate veins, the smallest 5 ft. wide and the largest 13 ft. The main ore-shoot is in the centre vein, which is traceable on the surface for 800 ft., and opened up for over 400 ft. The mine produces 40 tons per day, and 1000 tons of ore are always kept ahead of the capacity of their 40-head stamp-mill, which is arranged with two Howell cylinder roasters. The ore carries from $30 to $40 per ton silver and some gold. Much stoping ground is opened up, and there is any quantity of rather low grade milling ore.

The Alice, which lies to the east of the Moulton, belongs to the Alice Mining Company, of Salt Lake City. The main shaft is 700 ft. deep, and a winze sunk from the lowest level is down 100 ft. The ore from the 400 and 500 ft. levels has been stoped; there is good ore in the 800 ft. level, and driving is being prosecuted to cut the main ore shoot. In the 1st, 2nd, and 3rd levels the south vein has just been tapped, and shows 4 ft. of 50 oz. ore, which at the present time is the main point of supply. The bulk of the ore comes from the Magna Charta claim, which is also owned by the Alice Company, and which produces 70 tons per day of ore milling from 32 to 40 ozs. The shaft on this vein is down 500 ft., and is now going to the 600 ft. level. The company own about 4000 ft. of ground on the same ledge. The plant is very extensive, two mills, one of 60 heads the other of 20, and work 90 tons per day, the property producing from $80,000 to $90,000 per month gross.

The Poser, on the Alice lode, is developed by a 100 ft. shaft, from the bottom of which levels are driven out east and west on an 18 ft. pay ore shoot, the whole being timbered by square setts. The whole of the ore accessible is stoped as the work proceeds, and is shipped to the Silver Bow Hill.

The Silver Bow Company works a 30-head stamp mill with Howell's roasters. They own 14 patented claims, the principal ones being the La Plata, 400 ft. shaft; Belle of Butte, 360 ft. shaft; Grey Rock, 300 ft. shaft; Mount Moriah, 200 ft. The latter produces 20 tons of ore per day from a 6 ft. pay streak; the output of the other mine is now restricted by the capacity of the mill. All the ores are amalgamating ores.

The Clear Grit Mine is developed by a 217 ft. shaft. The upper levels are producing sulphide of silver ore in a rhodonite gangue, with quartz, which runs from $100 to $400 per ton. The lower levels are now turning into copper ore, and the company will erect a 50-ton smelter. The fact of the silver changing into copper ore at a depth of 100 ft. is somewhat remarkable. The bottom now shows 30 ft. of copper ore, with a large body of high grade copper pyrites and glance. It is owned by the Clear Grit Mining Company, of Philadelphia, H. C. Kessler being superintendent.

The Drum Lummon Mine is located near Helena, and worked under the supervision of Mr. G. Atwood. A tunnel is being run in to cut the vein, and has already attained a length of 400 ft.; the mine can be worked by chutes entirely without the aid of hoisting machinery. A 60-head stamp-mill is now on the road to the mine, and will soon be erected. Throughout Montana I am informed that this property is considered fully up to all representations that have been made about it, and that it shows an 80 ft. ore body, sampling $50 per ton. Grey copper occurs in the lower workings, mixed with a good deal of azurite and free gold. It was reported that the air was only an irregular "blow-out;" but Commissioner Read, of Montana, mentions that the walls have been discovered, thus dispelling the erroneous impression formerly existing. The mine is under good management, and people regard it as a bonanza, appearing to have great confidence in the property which is also in the granite formation of the country.

In Butte there is but one Customs smelter, and I learn the charges are about $50 per ton for smelting, which should make it a good point for more competition. The population of the town is about 8000, having an assessed property valuation of $6,000,000. The copper contains paying quantities of silver, rendering competition possible in the eastern copper market with such mines as the Calumet

and Hecla, while the rates of shipment to Swansea are moderate. The Union Pacific charge $32 per ton for ore shipped to Omaha, and $10 more takes it to Baltimore, from whence it can be shipped to Swansea. The Northern Pacific Railroad will build a branch to Butte during this year, from whence ores can be shipped *via* Portland, Oregan, and Cape Horn to Swansea. The rapid strides that Butte is making may be seen from the statement of the output of the copper and silver ores, which were of the value of $1,400,000 in 1880, increasing to $4,300,000 in 1881, and to $6,882,000 in 1882, whilst in 1883 (estimated on half-year's output) it will be $9,000,000.

The country has only very recently been opened up, and the capital investment is small when compared with the output, and, although the working expenses are at present high, the competition between the various railroads will bring things down so that an increased output may be assured, and even double within a short time. Miners get $3·50 per day; topmen, $3 per day; wood, $5·50 per cord; coal from Union Pacific Company's Mines, $8 per ton. The chief cost consists in treatment and freights, both of which increasing competition will soon reduce to reasonable figures, leaving good profits to all concerned. N. W. RUASTON READ, F.G.S.

Denver, Aug. 12. Consulting Mining Engineer.

NORTH CAROLINA MINES.

SIR,—The American mail just arrived, and among my letters I find one from Davidson County, North Carolina. I send you the following extracts as of general interest:—

Conrad Hill Mine struck a 6 ft. vein last week in bottom of the shaft 400 ft. deep, averaging $50 in gold per ton, and 9 per cent. copper. This is apparently a new vein, and must be added to the seven already discovered mineral lodes. Five miles from this mine is situated the Silver Valley Mine; they are putting up a new 100-horse power boiler, and a 7 ft. drum hoisting engine. At this mine they have recently cut a 7 ft. vein of argentiferous galena, giving 80 ozs. of silver per ton, besides lead and zinc. A mile and a half from here is the Cid Copper Mine. The shaft is now down 85 ft. in splendid ore; the tunnel is driven on the lode 70 ft., also in rich ore. Two miles distant is the Emmons Mine, now taking out similar ores to those found in the Cid Mine, and is undoubtedly on the Cid vein. Here an incline shaft is sunk to a depth of nearly 400 ft. Large amounts of copper and gold have been already taken away. The work has only been carried on a short time, as this property for years lay idle. The rich discovery of the Cid Mine induced parties to re-commence operations on the Emmons. The trouble is in this district that there are so many rich and likely places, one is almost bewildered to know where to carry on mining to best advantage, and I believe that owing to this fact many promising farms have been abandoned before the surface was more than scratched over, no real mining being done in most cases. I have shown some North Carolina copper ores to one of the best copper miners in the United Kingdom, and although he could but admit the rich character of the mineral he expressed doubt as to the formation being the right kind for making a good mine. I wish to remark that I have often been met with similar answers, not as regards this particular district only. Now it seems to me that theory goes too far when doubts, such as the above, are the result. For instance, some few year ago, it was, I believe, considered impossible to find a good mine in limestone or in sandstone, while we all know to-day that some of the grandest results ever produced have been derived from the above formations. I have myself seen petrified wood which was found in Southern Utah which went high in the thousands—*i.e.*, assayed over $1000 per ton in silver. With all due deference to my friend I cannot help being convinced that metal is where you find it, and experience in these matters should tend to confirm my opinion. I am afraid I shall be taking too much of your valuable space if I continue, but with your leave I shall again refer to the much-abused mines of North Carolina. M. PARRY GOSSET.

Old Broad-street, Sept. 5.

MINING IN NEVADA—PRACTICAL, MECHANICAL, AND CHEMICAL.—No. I.

SIR,—Practical mining in Nevada embraces as a rule the three divisions mentioned above. Nevertheless, the practical department here as elsewhere is one of itself, and distinct from the other two. In treating of the former in respect of metallic mining we cannot err in stating that it implies knowledge in the first instance—positive or probable—of the localities in which the ores of metals abound. And secondly, the proper methods of their specific discovery, development, and extraction. Precedence should, therefore, be given to the practical department, as without it the other two departments would have no identity or application. In Nevada practice, except in sundry instances, the proper system has been reversed, and undue prominence given to the mechanico chemical department instead of to the fundamental department, on the resources of which success wholly depended.

The erection and construction of expensive reduction works previous to opening the mines and ascertaining whether or not reduction works would be required in respect of them has been a fatal and oft-repeated error, the mania of which has not wholly subsided yet. The mountainous character of the country, and the comparatively frequent ebullitions of metalliferous minerals consequent on the eruption and disruption of the rocks in which they were situate, rending, elevating to, and scattering over the surface large sections and quantities of comparatively rich and commercially valuable ores and lode stuff. From such occurrences it appears to have been taken for granted that mining and quarrying were similar pursuits in the mode and manner of their prosecution. That it was only necessary to enlarge the area and to continue enlarging it to secure interminably proportional corresponding results. Assumption, too, was substituted for knowledge, figments for facts, and the dreams of immigrations endorsed as substantial realities. The consequence was that mining though not ignored was neglected, procrastinated, deferred as though its anticipated products were a demonstrated reality, its resources a foregone conclusion, and its *modus operandi* a manually, mechanical, commonplace proceeding. Millions of dollars were expended in this way. Costly and elaborate structures were provided and constituted for the reduction of large quantities of ores which were not only not developed but unevidenced as to their existence, or the proper conditions under which they might be found. Some of the companies were strong enough in funds to complete the reduction works they had begun, and which they were assured was all that was necessary. The products of the mines they were informed would not only suffice to defray the expenses of their development and the extraction of the ores but would yield an enormous revenue of profits meanwhile to the fortunate proprietors, enrich the State treasury, and enhance its prestige, the State as a mining field and centre. Either of the companies collapsed previous to the completion of the works which ignorance and arrogance had inaugurated, and accelerated with an energy and zeal misplaced and misdirected. Fate, however, was propitious to them. The non-consummation of their plans spared them the odium which an inevitable ultimate ignominious failure would have loaded them with a barrier more insurmountable than personal purpose. Caprice or human will supervened to shield them from the obloquy inseparable from the collapse of ill-conditioned and ill-contrived enterprises, which had no foundation other than slip-shod phrases and hyperbolic clap-trap, instigated by licentious fancy and irresponsible recklessness. If the millions of dollars that have been squandered in this way had been judiciously applied in the development of the resources of well-selected mines, such as the State abound in, and ordinary prudence exercised in the purchase of such meritorious properties, vast revenues of wealth would have accrued, and instead of now going begging for patronage they would be accessible representatives of elemental outline and embodied wealth, foreshadowed by conditions too self-evident to refute or question. The disasters I refer to have been a great set back, and they still sadly reflect on Nevada mining, but after all they reflect not on mining in the proper acceptation of the term, as their inception and procedure constitute no part of it, but rather is mining a reflection on them, as wherever it has been properly prosecuted its results have been different, and the outlook respecting the future vastly more cheering.

But the mines for the most part remain with their abundance of wealth unimpaired, and notwithstanding which one cannot fail to feel and express regret at the large amount of money which the abortive schemes I have adverted to have cost and squandered, it may be just as well for the present and succeeding generations that it was so; as what was lost in that respect may, and undoubtedly will, be more than compensated by another. I mean by the improved method of mining, reduction, and extraction of the precious metals, for if millions have been wasted in the way I have referred to many more millions have been lost by the imperfect metallurgical processes had recourse to in those times, so that if in this regard there have been serious losses there will unquestionably be a more than compensating gain. It is a well known and generally admitted fact that ores of comparatively low grade are those from which the bulk of the metals of commerce are derived, so that whatever tends to lessen the cost of their production adds more than proportionally to their economic value.

The cost of reducing silver ores in Nevada to the metallic state in former times was something enormous; at no very remote period of the past $60 per ton of 2000 lbs. was the customary charge for milling and amalgamating the ores, and 80 per cent. of the assay value was the maximum standard of reduction—that is, that ores of $100 per ton value by assay would be reckoned as $80 ores, from which the charge for milling, &c., $60 was deducted. There then remained $20 per ton from which bullion charges, taxes, carriage to the mill, and mining expenses had to be paid, whilst frequently the cost of carriage alone twice exceeded that amount. It was, therefore, imperative to restrict mining and the extraction of ores to exceptionally rich superficial deposits, unless, as was fortunately sometimes the case, the superficial led connectedly to deeper deposits when mines of vast wealth were opened. If it happened that the connection between the superficial and the deeper rock formations of metalliferous deposits was not intelligable to the operator or those who directed his course of procedure, which was much more frequently the case than not, the superficial sections limited and determined the enterprise, and the end ere a proper beginning had been made was reached, and the issue of its climacteric unrealised and unrecognised, the effect of which was that the best districts ordinarily considered were, and still are, comparatively neglected. Districts well formed and constituted geologically comprising large lodes of the true fissure class, with the ores principally disseminated throughout their gangue associations, and accompanied with the most approved and impressive solicit features indicative of progressively increasing wealth to depths which in the nature of things no rational limit can be set. It will thus be seen that what has hitherto restricted and retarded mining in this State has been the difficulty of realising its products, or even a moderate proportion thereof by the producers. ROBT. KNAPP.

Ione, Nye County, Nevada.

TACQUAH GOLD MINE.

SIR,—Is there no account of the Gold Coast Mines forthcoming, or are the hole-and-corner meetings held, as in the case of the Tacquah, without a representative of the Press present to furnish their shortcomings to the absent and far-off resident subscribers? Evidently a change of directors, whoever they may be, does not seem to furnish the ordinary shareholders with any news, whatever they may do to the promoters, their supporters at the adjourned informal, if not illegal meeting. The new manager sent a most favourable report, dated May 16, and in one part he refers to a native shaft under a cocoanut tree full of paying gold. I should like to know very much if they ever cracked any of the nuts, and what may be the result. Seriously, is there really a gold mine, a manager, and a full board of directors, and who are they, so that we know who to apply to for information, for it is nearly four months since anything has been heard, although at the meeting they expected by the following mail to hear something further. E.

Coleman-street Buildings, Sept. 6.

MINE LEASES AND DUES.

SIR,—I met a gentleman in this city a few days ago who said to me in substance:—"I see that you are endeavouring to deprive the landowners of their rights by taking away their underground property. What would you say if a man entered into your house or field, and say that he would use it as his own?" He thought that a parallel case to that of a man who desires to dictate to landowners the terms on which he should permit miners to develope his land. I think differently. Minerals are regarded as portions of the common wealth; and, therefore, it is for the good of the community that they should be extracted and utilised. If the landowner will do that himself, there is no power to hinder him; but if he will not do so, the law says that others may do it without his consent, and the law anciently fixed the conditions on which such legal power could be exercised. But for a long series of years the conditions have been varied in favour of the lord, and much against the interest of the miner, so that the burthen the latter has to bear is become intolerable, and redress is sadly needed, and must be sought after speedily. The gentleman referred to compared the minerals to a field or house, which are properties. You cannot say that minerals are the property of the miner or the lord before the products exceeds the cost of raising them. If after all the machinery and working costs are paid for there is a balance left that may be called property, and out of that the owner of the minerals, if produced by miners, should have a portion (say) 1-12th, and he should be paid fairly for all land destroyed or injured, so that he should be no loser by the mining operations under any circumstances. It is not reasonable for a miner to pay a royalty to the owner while he is losing by the works, but this unreasonable payment has been going on from time immemorial through the supineness of the miners who have tamely submitted to the imposition as an inevitable evil. I trust that the time is coming when the Legislature, as in former time, will interfere to encourage the mining industry by regulating, on a fair basis, the terms on which the mineral resources of Devon and Cornwall may be developed.

It is well that Parliament does not interfere and forcibly take lands for proper uses where landowners decline to grant, as in the case of railways, waterworks, canals, quays, &c. The promoters of a bill to be introduced to the House of Commons next session believe that the landowners, recognising its fairness, will offer little or no opposition to its becoming an Act of Parliament. We want for "reason to rule" in mining, and in everything else.

Truro, Sept. 4. R. SYMONS.

MINE LEASES AND DUES.

SIR,—The paper on the above subject, read by Mr. Symons, of Truro, at the meeting of the Mining Institute of Cornwall, recently held at Redruth, and published in the *Mining Journal* of Aug. 18, I perused with much interest; but must be allowed to differ from the remarks made by Mr. Frecheville, H.M. Inspector, in reference to the arbitrary power exercised by the German Government respecting the development of mining properties in that empire. Mr. Frecheville said at the meeting that "the custom in Germany and France was for a mine to be examined by the Government engineer, who settled how much of the money made should be used in deadwork of the mine, how much should be paid in dividends, and how much should be set aside for a reserve fund."

During my 11 years' residence in Germany I have had the management of the following mines:—Menzenberg Copper, near Honnef-on-the-Rhine; Anglo-Dutch Lead, near Dusseldorf; Philippino and Laura Lead and Blende, near Bonn; Carden Lead and Blende, Carden, on the Mossel; Virneberg Copper, near Honnef-on-the-Rhine. The three last-named the Government have accepted me as the representant of them; hence I have had the pleasure of being in regular correspondence with the Government mining officials upon mining matters generally, and they have neither intimated nor dictated to me as to the manner in which these properties should be developed, or how the money realised on sales of ore should be applied. Moreover, I may state that I have never heard of such law or custom being put in force as that mentioned by Mr. Frecheville; and it is reasonable to conclude that English capitalists would not invest in German mines under such law or custom. From two of the above mines over 50,000*l.* worth of mineral has been sold, and particulars have been forwarded to the proper quarter without the least intimation how the money should be used. This is a convincing proof that Mr. Frecheville's assertion is incorrect.

The facilities afforded to miners by the German Government for opening up their mines are excellent, and preferable to those at present in Cornwall, particularly since the passing of the Metalliferous Mines Act, the restrictive powers of which I became partially acquainted during a recent visit to my native town. Mine setts or concessions are here held direct from the Government in perpetuity at 1-50th, or 2 per cent. royalty, and no dead rent; dressing cost allowed at 1 mark per centner, or 20s. per ton of 20 cwts. The lease of the concessions is concise, containing only about 120 words; therefore, the verbosity of the instruments is not so objectionable as the one mentioned by Mr. Symons.

The engineer's chief duties to which Mr. Frecheville alluded are to thoroughly examine the shafts, underground workings, boilers, and machinery, &c., for the safety of the miners and other persons employed on the mines, also especially to notice that the skip, gig, or cage used for raising and lowering the miners is properly constructed, and made in accordance with the mining law before a permission can be granted to set the same in motion. No skip, gig, or cage is allowed to be erected for this purpose without having a patent safety-catch or winding apparatus attached, whereby the security of the cage containing the miners ascending or descending is assured. If such restrictions as these had been observed in Devon and Cornwall, I feel convinced the many fatal accidents reported in the *Mining Journal* from time to time might have been avoided. The patent safety-catch is simple but powerful; and to illustrate the usefulness, efficiency, and effect of this excellent apparatus, I would observe that some time since, in the mine from which I am writing, the steel wire rope, 1 in. diameter, to which the drawing cage was attached, when within 10 fms. of surface, suddenly snapped, and although the cage, wagon, and copper ore weighed upwards of 2½ tons, the action of the apparatus was instantaneous, the cage not having fallen or slipped 1 in. Had such an apparatus been attached to the gig used at Wheal Agar for raising and lowering the miners, the distressing catastrophe at this mine would have been prevented. R. K. ROSKILLEY.

Grube Virneberg, bei Honnef-on-the-Rhine, Sept. 5.

COAL MINING IN NORTH STAFFORDSHIRE.

SIR,—With deep interest I perused in the *Mining Journal* of Aug. 21 a condensed account of a paper read by Mr. Chas. Gordon on the above subject, before members of the North Staffordshire Institute of Mining and Mechanical Engineers, and the following observations emanating therefrom may not be uninteresting. The author of the paper in question is correct in stating that in no other district can mining be seen in such variety as in North Staffordshire, and taking the general principle of mining throughout for practicability and economy, I believe it will bear favourably with any other district in England, still it must be admitted from its history that it is far from reaching perfection in any particular branch beyond that of winding. There is such a dissimilarity in the several coal fields of Great Britain that it is almost an impossibility for a single Act of Parliament to reach them with regard to their efficient mode of working them on even the most general terms, consequently the onus of the responsibility of their working falls upon the shoulders of the management (with the certificated men, of course, this is foreign language.) There is, however, one important point in connection with all collieries I think would ensure the saving of many lives, and that is (however unpalatable the statement may be to proprietors) the prohibition of the use of naked lights. It is a fact that in all coal seams gas is found in more or less quantities, and no seam is proof against an issue of explosive gas—the use of the safety-lamp so far is the best protection against loss of life in this direction. I am well aware from personal experience that safety-lamps are inconvenient to work with (I am speaking of getting coal) and, moreover, an expensive item to purchase and keep intact when compared with candles, but if by making their adoption general would be the means of saving life—which in my mind is a certainty, from many instances of late years—this question ought to have the grave consideration of those who are placed in power by the State to obviate as far as human agency goes the wilful sacrifice of human life. The best known system of working coal seams is, as Mr. Gordon states, that of the longwall, and if it were adopted in many cases where it is not and might be with advantage, many colliery proprietors would feel the benefit of it. There are cases where it would be impracticable.

Mr. Gordon also states that from choice he would rather work a fiery seam than one where gas was only seen occasionally, since it kept both officials and workmen constantly on the alert. This is not bad logic, and doubtless correct; but it is a proof that my suggestion with reference to the general use of safety-lamps and the enforced prohibition of naked lights is somewhere near the bull's-eye. Prevention is better than cure, and although the present most improved safety-lamps, and the best mode of ventilation will not attain this object, they are the best and only means at hand whereby we may use the limit of our power in this direction. Certificates of competency for the management and working of collieries are well enough, but these alone will not prevent explosions or accidents. There requires a safer system of lighting collieries than even the safety-lamp, and an explosive for blasting coal less harmless than any hitherto in use, and if the State would offer a premium for the best substitutes for these important adjuncts in the working of collieries, they might soon benefit the poor collier immensely by minimising the risk he daily goes through in his dangerous occupation. The New Patent Laws when in vogue may assist in this direction.—*Perranporth, Sept.* 5. W. NINESS.

PALMER'S SHIPBUILDING AND IRON COMPANY.

SIR,—This company having just declared the very satisfactory dividend of 5 per cent. for the past half-year (35s.) per share on the A shares, and 25s. per share on the B shares, a brief account of the undertaking since its formation will, no doubt, be found of interest to many. The company was formed in 1865, when the vendor, Mr. Charles Mark Palmer, guaranteed that the nett profits should be 100,000*l.* per annum for five years, and further guaranteed 12½ per share upon any capital expended for extensions. It was also arranged that Mr. Palmer should continue as managing director of the company during the period of five years. On June 30, 1870, the vendor's guarantee expired. Mr. Palmer then became the Chairman of the company. During the five years of Mr. Palmer's management everything was carried out, and the profits were as satisfactory as could be expected, and the shares stood at a premium on June 30, 1870 (as per balance-sheet B). There was a reserve fund of 175,000*l.*, which was divided by way of bonus in the proportion of one new share; of 7*l.* for each old share, the A shares (35*l.* paid) receiving one fully-paid share; B shares (25*l.* paid) one share, 5*l.* paid; C shares (20*l.* paid) one share, 4*l.* paid. These shares were afterwards all converted, and are now all 25*l.* paid, or 35*l.* paid up shares. For the year ending June 30, 1871, the dividends paid by the company were equal to 9 per cent, and for 1872 10 per cent. After this time the affairs of the company were not so satisfactory; but from 1876, under the able management of Mr. John Price, to the present time, the position of the company has improved each year. The present management commenced with a debit to profit and loss account of over 30,000*l.* in the first year (by June 30, 1877). This debit has been reduced to 7000*l.*, and at the end of the second year (June 30, 1878) the debit had become a credit of 46,689*l.*, the profits for the year being 53,675*l.*: 9500*l.* was written off, and 27,026*l.* paid in dividends, and 10,162*l.* carried forward. In 1879 the year's profits were 44,108*l.*, when 6200*l.* was written off, and a reserve fund formed of 20,000*l.*

From this time each year has seen its improvement in every respect, as was shown by the very satisfactory balance-sheet of the year ending June 30, 1882, the profits for that year being 79,344*l.*, when 15,000*l.* was written off and 10,000*l.* added to the reserve fund (making it up to 50000*l.*), and 54,052*l.* was paid in dividends. The balance-sheet for the year ending June 30, 1883, is not yet issued; but the profits are understood to be double those made in 1882. It will take 76,574*l.* to pay the year's dividend, so that the directors are likely to have, after providing for the dividends, about 70,000*l.* at their disposal. They will probably make up the reserve fund to

100,000*l.*, and write off the balance to depreciation, &c., which will certainly leave the company in a most satisfactory condition; and still the shares stand at the very low price of 20*l.* for 25*l.* paid share, and 28½ for 35*l.* fully-paid share. S. N. CHALLONER.

Newcastle-on-Tyne, Sept. 6.

MINING NOTES AND RECOMMENDATIONS.

(WEARDALE.)

SIR,—Under exceptional circumstances the Weardale Lead Mines were introduced to the public in June last with the title of the Weardale Lead Company. The mines and smelting works, lately held by Mr. W. B. Beaumont, M.P., are leased from the Ecclesiastical Commissioners. The property is situated in the celebrated lead district of Durham, and not far from the junction of the three northern counties—Northumberland, Durham, and Cumberland. These highlands form a part of the Penine range. The highest point in Durham is Kilhope Law, 2206 ft. above the level of the sea. The wild scenery of this district well repays the tourists for their trouble.

It is not an uncommon custom for shareholders in British mines to spend their holidays in the immediate neighbourhood of properties in which they are interested; and while recruiting their health they are enabled to make observations of a practical nature. They see for themselves their mines, and can explore the mysteries of levels and cross-cuts, examine the *modus operandi* of metal mining generally, and glean information on the spot which gives them greater insight. Besides this they gain an intimate knowledge of the manners and customs of miners, which of itself affords interest and pleasure, as well as creating new sympathies, and thus a better association with the mining industry. Take a peep at this moorland scenery, the hills, and dales, and gulleys, and see the Wear and its surroundings. Looking east there are broad and low lying plains, rolling hills, and moors that are pictures of loneliness. Dreary they may be, but they are pleasing. Then rough and rugged districts rise to view. On the west the hills are abrupt and wild, and there flowing to the south is the Wear, at St. John's Chapel a mere stream. Among these dales are found some of the rarest bits of scenery. Here the dale narrows, and there the river rushes on to the wider valley. This is the centre of Britain, midway between the lowlands of England and the highlands of Scotland, the highest populated district in the land. The thousands of inhabitants who live in these retired regions are for the most part engaged in mining and smelting.

Here and there the white cottages of the miners stand out in bold relief in the rich grass lands. The hamlets are few, for the homes of the miners are scattered over the plains. Weardale men "are lusty lads and large of length," the prowess of whose forefathers has found praise in tradition, ballad, and history. And yet we know comparatively little of this neighbourhood, and the "memory of man" is almost the only record of the past. The description of the physical character of the district and the men equally applies. The wild country has stamped its impress on the men; but we find beauty in the kindheartedness of these people who are well-nigh shut out from the busy world. They possess great natural intelligence, and employ their leisure in literary and mathematical studies, the correct science being in great favour amongst them. In connection with the Weardale Mines there is a school, library, and a friendly society. Having thought and care like this it is only to be expected that they will be found to be, as they are, temperate, frugal, and in fairly comfortable circumstances. During the past few years they have, however, suffered great privations, in consequence of the partial and almost total suspension of mining operations, brought about by the action of the late lessee. But times are changing and brighter days are beginning to dawn again on the Dalemen. If full prosperity is possible (and there is little doubt it is) the company will exert itself to the utmost in accomplishing it; and while benefiting itself the hearts and the homes of the miners will be made bright once more. "Rookhope Ryde," a ballad composed in 1572, records the deeds of these brave men; here is a verse:—

> The Weardale men, they have good hearts,
> They are as stif as any tree;
> For if they 'd everyone been slain,
> Never a foot back man would flee.

The white spar of the Great Trunk lode of Weardale can be traced for miles. It traverses the hill top, and now it is seen in the gulleys and again climbing the hill sides. What a contrast is the great white back of the famous lode to its surroundings. It strikes the observer in more than one way, bringing to mind, as it does the wealth that has been won from it and the riches which still await the miners' skill to win them. Weardale is the great lead measure of the north. It extends for 20 miles north and south, and 20 miles east and west—400 square miles—the largest and richest deposit of silver-lead in the kingdom. Over one-fifth of this great area—85 square miles—is leased to the Weardale Company, whose mines have produced more than any others in the country.

The early mining processes were of the rudest description—foolish theories, cramped enterprise and hindered real progress. These things have passed away, and machinery of the most approved principle is now at work, and with the addition of a few improvements at a small outlay in the dressing department, can be made perfect. For upwards of 70 years the Beaumont family worked these mines, and possessed the sole right to explore and develope the property now secured to the Weardale Company. E. R. GABBOTT.

CAUSES OF DISAPPOINTMENTS.

SIR,—We often hear complaints made by numerous people of the great amount of money that has been lost in mining, and it is often the case that the blame is thrown on the managers or agents, that they either were too sanguine in their representation or that they have not worked the mine properly. If you will kindly allow me a little space I think that I can point out clearly why it is that there are so many disappointments in mining speculations. They are owing—First, to credulity. It is marvellous how confiding some people are, especially when we consider that in many other matters they have been well trained to the weighing of evidence. Here they seem to be ready to accept any report or prospectus that promises a large fortune for but a small outlay; and that which must necessarily follow is mortification and disappointment, which might be avoided if a little precaution were taken. Let everyone who thinks of speculating on the strength of large estimated reserves, as we sometimes see, examine how those estimates are made, or what is the basis of the calculation. I remember some years ago that some parties, having found a leader of lead on one lode worth about a ton to the fathom, estimated the value of the lead in the various lodes to be worth in net profit 1,500,000*l.* You may not remember, perhaps, how I showed in the *Mining Journal*, by the same process of reasoning, that there was not a bit of lead in the mine. There are always men to be found whose only object is to abstract money from the confiding speculator, and it is wonderful how they succeed. To them it is of small importance whether the mine itself succeeds or no, if they can succeed in their nefarious purposes. Examples of such persons are so well known to your readers that there is no need to refer to them. Secondly, the non-success of a great number of speculators is owing to their incredulity. They have been induced to invest in worthless things through such glib talk and glowing reports as above mentioned that now they believe in nothing, and the value of men and things are all estimated according to their sad experience with the iniquitous swindler; and so, when they are asked by true men (for there are many to be found even in mining) to take an interest in a *bona fide* concern, a thing in which they might recoup their losses, they turn away as though disgusted with everything. And there are others who have not well calculated on the necessary delay which sometimes take place in developing a mine, and the unforeseen events which take place in the pursuit of the given object involving the use of more money than was at one time thought necessary; and so, however near that object they may be, they throw the thing up and leave others to come in and reap the benefit of the capital they have spent. Leaving this, they are brought sometimes within the influence of another current, which carries them over the falls, or being led away by an *ignis fatuus* they meet with a similar end, and all is lost.

The two principal attributes necessary for an investor in mines are hope and patience. In speaking of hope we must not confound its meaning with desire, or longing after certain good, as it is often the case with some, for even were our longings infinite, and there be no reasonable grounds for expectation, it does not amount to hope Hope is desire and expectation interwoven, as it were, with each other. It will be asked, and very properly so, how am I to obtain a reliable foundation for my hope in matters of this kind? I say, let every intending investor make every possible enquiry of persons qualified to judge—of some one whose life-work has been the study of the great secrets of Nature in depositing her wealth in the bowels of the earth, and who has some regard for truth; and, although such person does not claim infallibility, his opinion is more to be relied on than any interested theorist, and the investor will, in all probability, be guided aright.

He will thereby understand the nature of that foundation on which he builds his hope, and realising his safety he will be inspired with the rare attribute of patience, and will be content to wait his future good. I will say further that it is not enough for the investor to know that he is interested in a valuable property; but he should ascertain that the best means are used for obtaining the desired end, and that his money is not spent in useless work. When, therefore, an investor is satisfied that he has a good property, and that his money is spent in an intelligent manner he will have just grounds of expectancy, and will by patience and perseverance wait for results. He will have a check on credulity, and an equal check on incredulity.

Llanrwst, Sept. 6. JOHN ROBERTS, M.E.

THE PREFIX HUEL AND WHEAL TO THE NAMES OF CORNISH MINES.

SIR,—It seems strange to understand what has induced some of the recent authors of works on mining subjects to use the word Huel as a prefix to the names of Cornish mines instead of Wheal, as the word Huel has been obsolete in this county for many years. In a book published in 1873 on mineralogy, the word Huel is used to the names of all the mines which are better known in the present era of mining by the prefix Wheal. Although the words may be known by some readers to be synonymous, many enquiries are frequently made respecting the origin and definition of the terms Huel and Wheal. There have been several origins ascribed for these words by different authors. The late George Henwood, M.E., in his work on Geology and Mining, gives the definition which he mentions as the most feasible meaning of these terms. Huel is implied to refer to the old Cornish word huel or hole, thus applying to a mine as a hole in the ground, and the word wheal is said to be a corruption of the word wheel, which was the only method in operation in olden times for draining the water, and when the prefix wheal was used to the name of a mine it signified that the enterprise was worked by this necessary adjunct. It is a question of doubt which of these two is the most correct, but although the terms may be admitted to be synonymous, huel in the early ages of mining might have meant, as asserted by writers, a mine without a wheel, and wheal a mine with a wheel, as on some of the superficial workings on the tin lodes water-wheels and appendages were applied to drain the excavations, whilst at other places (on the tops and by the sides of the hills) adit levels were driven to drain the tin workings. S. J. VINCENT.

Cheesewring Railway, Liskeard, Sept. 3.

MINE CAGES—A NEW INVENTION.

SIR,—As long as wire ropes are used for winding purposes in our Cornish mines there will be the absolute need of safety apparatus attached to the cages in order to prevent a repetition of such an accident as that which occurred at Wheal Agar of very recent date. The apparatus, to be effectual, should be self-acting. There should be no difficulty experienced, arising from want of uniformity, either in the ascent or descent of the cage, so that the safety apparatus, being automatic in itself, might act the very moment that a breakage takes place in the rope. The cage travelling over different gradients of an incline plane—as is often the case—should at all times have a proportionate weight attached to the rope. Both the cage and the road should be so adjusted that the safety apparatus would act with equal facility in any gradient part of the "skip-way," as well as in the vertical part of the shaft. There should be no descent over the incline wherein the rope should be allowed to get slack, and the cage to fall jig-jog by sudden shocks, which are perilous to the best manufactured rope, as well as hazardous to the safety of those who make such a descent. This, however, need not be, as there is no incline so flat, even with an empty cage, that there may not be the slightest difficulty experienced in making a gradual descent. In a difficulty of this kind, if it be regarded as such, the only possible way to obviate it is to make the road and fix the rollers, that all the connecting gear have a relative bearing according to the ratio of the line or gradient of the road. In these days of scientific knowledge, when almost every branch of science is being made a particular study—when the workshop and the studio are so closely allied to each other, and our mining and other Institutes are placed within reach of the masses for their personal acquisition of knowledge in all the various movements of life, one would have expected quite a revolution in the mechanism of winding gear, and ample provision made to meet all the contingencies incidental to transit in connection with cages freighted with human lives.

This is the more conspicuous, since mining has of late years been receiving the attention of those who are associated, and are said to be practically acquainted with the mechanical sciences, so that it would seem almost impossible to have imagined that the lives of our mining community should be placed in jeopardy, or that any neglect should be suffered for the want of life-saving appliances being provided in case of accident, but that their lives must be hinged on the the casualty of a mere wire-rope—which may break at any moment—on which their lives entirely depend. Coming to the invention, then, several things have to be considered. The laws of falling bodies and their momentum, which is produced by their specific gravity partly, and also by the centre of attraction, should not be overlooked. For instance, all bodies of equal density fall at the same ratio. But, in addition to this, the chief thing to be observed is that the cage be free from oscillation. Of course, I suppose it would be almost beyond the ability of the most skilful engineer to fully prevent the least vibration to the cage on its way; but what I mean is this, that the cage should run on wheels and metals, so that it should run within a gauge of at least an inch in vibration. This being rendered as perfect as it may, and as it should be, I conceive no difficult task in placing a self-acting safety apparatus to the cage, which would, I think, prevent it from falling at all more than 2 ft. when severed from the rope in case of accident. If the mechanical appliance referred to were used it would be a contrivance equally as safe as that of the man-engine. Still, for speed, the man-engine is far preferable to any other means that has ever been introduced for the ascent and descent into our deep mines. The man-engine can be utilised for the purpose of drawing up the mineral ores, that intermediately, as well as that of conveying the men up and down from the surface, thus economising the expenditure in machinery, which at all times is no small item in our mining operations. Another advantage is this, that there can be no fear of disaster arising from overcrowding, as is the case with regard to mine cages. Notwithstanding all the objections to the use of the cage, yet if our mine directors—for the sake of economy—will persist in cages being used, one thing is pretty certain that the time is not far distant when preventive means must be resorted to, and there can be no doubt that, if a reliable safeguard be introduced, the Board of Trade will insist on its being employed to every cage without exception.

Now, Sir, without a shadow of egotism, or that I wish to be thought vain and pedantic, allow me to say that after some amount of cogitation on safely appliances, I am led to believe that the apparatus which I have designed cannot fail to suspend the cage the moment any accident occurs to the rope. This design I have submitted to the well-known and influential firm of Tangye Brothers, engineers, &c., Cornwall Works, Birmingham, and these gentlemen, who are considered competent authorities of matters of this kind, have advised me to submit the same to some mine managers, "who will be able to form an opinion, based on practice, of its value." I am, therefore, anxious to have my views criticised by experienced men. I am not aware that there is any apparatus in existence of a like kind. I claim for it originality of conception, at least. I am told, however, by those who seem adequate to give a definite opinion of its value that this appliance possesses features which theoretically seem to strongly recommend it.

Finally, then, I shall have great pleasure in laying my plans before our best mining engineers and mine agents and others with a view to their being fairly tested. J. F. TIDDY.

Richmond Hill, Truro, Sept 3.

NORTH WALES GOLD MINING.

SIR,—It is a long time since I saw anything in the *Mining Journal* relating to the above matters. I should like to hear a little news with regard to the present movements. I am an investor in several mines at home and abroad, and should be happy to learn if the present movements are likely to turn out successful, and if they have any new method to extract the precious metal from the various minerals, and if so who is the chief originator of the same. A few months ago I noticed in the Journal that gold was visible in some of the reefs several fathoms, and the discovery of the whole turned out most satisfactory. It is most unfortunate that no official record of the amount of gold found during the last few months on the Welsh hills so far has not been published in the *Mining Journal*. I regret that the yield of gold from various mines which have been worked from time to time could not be obtained and published in the Journal.—*Dolgelly, Sept.* 6. R.

WHEAL CREBOR.

SIR,—It is strange the public are so indifferent to the prospects of a good mine that they allow the shares of this concern to remain unnoticed at the present ridiculously low price of 2*l.*, or 24,000*l.* for the mine. The mine is opening out well in the bottom levels, where the ore now being raised averages 10 or 11 per cent. The last sale, including mundic, will realise 2050*l.*, and leave a profit of 850*l.* on the two months' working. This rate of profit will enable the committee to pay dividends at the rate of 8s. per share per annum, equal to 20 per cent. on present price of 2*l.*, and the prospects of the mine are so excellent now the 48 fathom level east has entered on a new body of ore far in advance of any hitherto seen in the mine, that the dividends are likely to be increased during the next 12 months. The financial position of Crebor is first-rate now. No merchants' bills owing, and the monthly working cost paid up as close as is practicable; notwithstanding which there is in hand in cash and ore bills nearly 2400*l.*, with no liabilities whatever. Where is there another Cost-book mine in the same sound and flourishing financial condition? Crebor is really managed financially on the Cost-book System, and is an example to be followed by all other Cost-book companies.

London, Sept. 6. ARGUS.

THE CHACEWATER MINING DISTRICT.

SIR,—It is very gratifying to one who has resided the greater part of his life in this place, and who has taken a personal interest in assisting to develope the mining resources of the district, to find that there is now every probability of other mines being actively worked under favourable conditions, and with every hope of assured success. The richness of Killifreth, which has paid dividends for about two years with every prospect of continuing to do so, and the steady development of West Poldice and other mines has called the attention of certain London capitalists to a district, than which I venture to say no part of Cornwall contains more undeveloped riches, there passing through it many of the best known and productive tin and copper lodes, with several strong elvan and cross courses, which have where worked in depth invariably increased the richness of the lodes. Immediately to the east of Killifreth are two setts, through which the Killifreth and West Poldice lodes run. I am happy to learn that grants have been obtained from Lord Falmouth, and that a limited company is being formed (Mr. C. E. Beckett, secretary, Crown-court, Threadneedle-street), and to which I wish success, to work East Killifreth. Here sufficient has been done to find regularly defined and productive lodes at a shallow depth, and every miner in the neighbourhood speaks in the strongest terms of the probability of the development of this almost virgin sett into a paying mine at an early date. If this should again lead to the working of that grand old mine, Great Wheal Busy, undoubtedly one of the richest mines in Cornwall—stopped some years since when tin was at its lowest—it would be a great boon to the neighbourhood as well. It is certain to be remunerative to the shareholders. A RESIDENT.

Chacewater, Sept. 3.

MINING IN THE CHACEWATER DISTRICT.

SIR,—I am pleased to find that mining in the Chacewater district is looking up, and that the sett known as East Killifreth has been taken up by a London company, who will very soon commence operations. As I have known this piece of ground for more than 20 years I may say that I am surprised that no attempt at working on a large scale has hitherto been made. The lodes of Wheal Unity, West Poldice, and at least one of Killifreth lodes, run through the sett, and tin has been returned in past times. The sett is almost virgin ground, and there cannot be the slightest doubt that 12 months' energetic working would develope the mine so as to make the fact of it being a lasting concern a reality and not merely a probability.

Another very promising and wholly virgin piece of ground is the sett immediately to the north of East Killifreth, through which the rich lodes have been so productive in Killifreth pass. Here, again, there is an undoubtedly successful speculation, and one that could be very cheaply worked. Great Wheal Busy also under efficient management is bound to be worked with profit to the adventurers, and here there is a great amount of work done ready to their hand, so that returns could be made (say) in six months that would meet the cost. Chacewater has been under a cloud for some years, but I firmly believe that the energetic action of the East Killifreth will be quickly followed by the reworking of the other setts, and that they will all reap the reward they deserve. A MINING ENGINEER.

Chacewater, Sept. 4.

A SINGULAR "FIND."—The captain of a vessel which recently arrived from the Newfoundland seal fishery says:—"The solitary iceberg I saw had carrying along on its top surface a boulder of about 2 tons weight. The crew of the Eagle succeded in getting it attached to one of the ship's cables, and hoisted it on board. It now lies on the quarter deck of the Eagle, and, strangely enough, is of quartz formation, with some fine specimens of gold cropping through it."

HOW MINERS ARE TREATED IN CHINA.—The life of a section of the mining population of the Celestial Empire is painted in anything but roseate hues by a native artist who has good opportunities for knowing the truth. The Governor of Hunan has been making enquiries as to a system of slavery that prevails in the mines of Lei-yang Hsien, and the result appears in the last abstract of the Pekin Gazette. The commission of enquiry consisted of two graduates and the magistrate of Lei-Yang. They rescued 140 unfortunate captives from their immurement in the mines. There are a number of coal mines in the district, and after having been worked for a time the seams became flooded with water, which has to be baled out before the extraction of the mineral can proceed. The supply of labour for this purpose is said to be in the hands of coolie contractors, who are distinguished for their cruelty and rapacity. These Water-hongs are the owners of low gambling-houses and opium dens. The aim is to involve the customers of these establishments in debt, and eventually to force them to sell their only remaining asset—their bodies. They are then sent to the mines to act as "water frogs." It is also asserted that persons are kidnapped for the purpose of being thus forced into servitude. These unfortunates, stripped of clothing, relieve each other day and night in the work of baling out the water. Any remissness or even signs of fatigue is punished by the task-master's whip, and the penalty for an attempt to escape is to have the feet stabbed with knives. The long and exhausting work in the dark, chilly mines kills the feeble, and those who survive are detained *oubliettes* of the coolie contractors for a second season of this deadly

toil. "They have no communication with the outside world, and in many of these mines some hundreds of poor wretches must be annually done to death, while in none is the mortality less than some score or so a year. As they die they are buried in some hole in the mountain side, and as their relatives and friends know nothing of their fate no report of the deaths is made or inquest held upon the bodies." An effort is now to be made to put an end to these enormities, and we hope it will be more successful than the previous attempts to suppress the slavery of the mines.

FOREIGN MINING AND METALLURGY.

The firm tone in household coal upon the Belgian markets has become more decided during the last few days. It sometimes happens that consumers do not wait for the actual commencement of winter before laying in supplies, and this appears to be the case this year. If a revival could but be witnessed in metallurgical affairs the general condition of the Belgian coal trade would be entirely satisfactory. As matters stand, industrial coal, while enjoying a tolerably ready and continuous demand, is relatively weak, and there is no longer any idea of advancing rates. The small advance attempted at the commencement of August has not had the success which had been anticipated—indeed, in some isolated cases, transactions in industrial coal have been concluded with some concessions in prices, and colliery proprietors show themselves generally somewhat accommodating to industrials. Coke has been firmer, and it would be difficult to procure it at the depressed rates recently current. There has been no material change in the French coal trade. Production appears to be making further progress in the Pas-de-Calais, in which there has been of late 52 working centres in activity. The total extractions effected last year was 5,706,390 tons, as compared with 5,320,383 tons in 1881. In 1876 the extraction did not exceed 3,336,919 tons. Although the increase in the extraction continued in 1882, it was less rapid than in 1881, the advance in that year over 1880 having been 476,067 tons. On the other hand, it should be observed that during the first few months of the current year the augmentation was very marked, as compared with the first few months of 1882. The number of workpeople employed in coal mining in the Pas-de-Calais last year was 25,991. The sales of coal effected in the Pas-de-Calais last year were 5,305,371 tons, while the consumption of the mines and local coke furnaces absorbed 409,062 tons more, so that the stocks on hand at the close of last year were very small. A good current of business has been noted in coal in Westphalia. This is attributable to concessions made by colliery proprietors and local ironmasters. Household coal is at present in good demand upon the German markets.

The only change noticeable in the condition of the Belgian iron trade has occurred in pig. A few weeks since the industrials of the Grand Duchy of Luxembourg were overdone with stocks, and as they could not find sufficiently rapid outlet for their production in Germany they endeavoured to dispose of them in Belgium. Deliveries from the Grand Duchy of Luxembourg have, however, fallen off of late, and the result has been increased firmness in pig upon the Belgian markets. The price of Belgian pig has been fairly established at 2*l.* 18s. per ton, and Athus-Halanzy pig appears to be tending above 2*l.* per ton. It is hoped that there will be a sensible improvement at the commencement of winter, when puddling-furnaces will be generally lighted. There is this satisfactory feature about the Belgian iron trade—the relatively low rates current for pig are enabling ironmasters to lay in supplies of raw material for some time to come, and as labour is also cheap they have every encouragement to extend their production. Employment is fairly general in the Belgian ironworks, and fewer and fewer works can be said to be carrying on their operations merely from day to day. Upon the whole, it may fairly be stated that there has been some improvement in affairs; but this improvement has only reached an early stage, and it is difficult to say whether it will acquire more importance. The lowest rate current for No. 1 iron is 5*l.* 2s. per ton; in September, 1882, the corresponding price was 5*l.* 4s. per ton. A difference of 8s. per ton per number continues to be well defined. Plates have shown much firmness. No. 2 has ranged between 6*l.* 16s. to 7*l.* per ton, the latter price being that most generally current. The new classification, to which reference was made recently under this head, has been adopted; but it is only obligatory as regards foreigners. A considerable demand has been noticed of late in Belgium for iron for trucks intended for exportation to Panama among other localities. Contracts for *materiel* for the Belgian State Railways will be let next month. There will also be an adjudication for old *materiel* to be taken from the Belgian State lines. Complaints are current in the Grand Duchy of Luxembourg of a want of rolling stock for the conveyance of minerals from the Grand Duchy to Belgium *via* the Guillaume Luxembourg and the Belgian State lines.

There has been scarcely any change in the French iron trade, Quotations for iron have been somewhat lower, and it is difficult to see how they can leave anything like adequate profit. At Paris merchants' bars have continued to be sold at 6*l.* 16s. per ton, which would seem to show that some forges must be selling at 6*l.* 6s. per ton on trucks at Paris. Yet the official quotation in the Nord is 6*l.* 12s. per ton, that for girders being 6*l.* 16s. per ton. In the Haute-Marne small orders for re-assortments have afforded employment for the works. The basis price for iron from coke-made pig has remained at 7*l.* 12s. per ton. Mixed iron, a more important fabrication, has been dealt in at 8*l.* per ton, with concessions in the case of large transactions. In the German iron trade quotations have remained nearly at their former level in all the principal producing centres, and favourable symptoms are not lacking. Fresh orders for spiegel pig have come to hand from the United States. As regards other descriptions of pig new contracts are comparatively scarce, consumers having available supplies until the end of the quarter. There has not been much activity in bars in Germany; some of the rolling-mills have orders in abundance for this description of iron; but others are almost wholly without employment. Orders for iron and steel wire have come to hand on American account. Boiler-plates are beginning to be in some request. Although the steelworks have plenty of employment it is time that orders should become more numerous, especially for railway plant, as contracts are being very generally worked out. The works producing machinery are generally well employed at all the foundries. The production of pig in the Zollverein in July was 281,960 tons, of which 173,704 tons were puddling pig, 7924 tons spiegel pig, 38,844 tons Bessemer pig, and 24,919 tons casting pig. The production of July, 1882, was 267,133 tons. The production of pig in the Zollverein in the first seven months of this year were 1,952,314 tons, as compared with 1,782,313 tons in the corresponding period of 1882.

ALUMINIUM AND ITS ALLOYS.—At the present time aluminium is manufactured by reducing the double chloride of aluminium and sodium by means of free sodium, and it has hitherto been believed that aluminium compounds cannot be reduced by any metal other than either an alkaline metal or a metal of an alkaline earth. By the first part of this invention metallic manganese, mixed or alloyed or not, with another metal or other metals, is substituted for the sodium which has hitherto been exclusively employed for the purpose in question. At present anhydrous aluminium chloride is obtained (and it has never hitherto been obtained otherwise) by heating a mixture of anhydrous alumina and dry carbon to a high temperature in a stream of chlorine gas. For this costly method of obtaining anhydrous aluminium chloride Mr. WALTER WELDON, of Burstow, substitutes by his present invention the method, which consists in fusing cryolite, natural or artificial, or artificial or native aluminium fluoride, with anhydrous calcium chloride, or with the anhydrous chloride of an alkaline metal, or of an alkaline earth metal other than calcium. And by substituting for the chloride of such metal the bromide, iodide, or sulphide of such metal he obtains bromide, iodide, or sulphide of aluminium at will. He then reduces any of these compounds of aluminium, either by sodium or manganese, mixed or alloyed or not, with another metal or with other metals. To obtain alloys of aluminium, under the present invention, he has present with the bodies which are to react upon each other to yield metallic aluminium, the metal an alloy of which with aluminium he desires to obtain.

THE TIN TRADE.

Messrs. EBELING and HAVELAAR (Rotterdam, Aug. 31) write:—There has been very little variation in our Tin market during the month under review. The trade have continued buying on a satisfactory scale, as will be seen from our deliveries. Speculation however has again been far from active, and forward deliveries were consequently neglected. Prices at the beginning of the month declined from ½ fl. to ¾ fl., but the lost ground was speedily recovered upon an improved consumptive demand setting in. Banca has been very firmly held during the greater part of the month. At one time small lots ex July sale were offering at 58½ fl., but we have since recovered to 57¼, which is our closing quotation. Billiton from 56½ fl. the price gave way to 55½ fl., at which latter figure everything offering was eagerly picked up. Increased firmness on the part of holders caused an advance to 56¾ fl. for spot parcels, distant deliveries, which had been dealt in as low as 56 fl., advancing to 57 fl. Our present price for 14 days' prompt is 56 fl. and for December delivery 56¾ fl.: 10,000 peculs Billiton offered in public sale at Batavia on Aug. 29 fetched the average price of 63·87 fl., costing to sell here about 56¾ fl. by steamer. Next sale, comprising the same quantity, will be held on Oct. 30.

The position of Banca tin in Holland on Aug. 31, according to the Official Returns of the Dutch Trading Company, was:—

		1883.		1882.		1881.
Import in August	Slabs	16,239	.....	8,986	.....	11,190
Total eight months		115,606	.....	112,801	.....	96,758
Deliveries in August		14,398	.....	11,111	.....	14,693
Total eight months		88,684	.....	87,004	.....	104,303
Stock second hand		29,765	.....	30,043	.....	25,749
Unsold Stock		102,621	.....	81,919	.....	61,735
Total stock		132,386	.....	111,962	.....	87,484
Afloat	Peculs	2,900	.....	5,000	.....	5,950
Statement of Billiton.						
Import in August	Slabs	7,700	.....	9,700	.....	7,300
Total eight months		81,090	.....	90,451	.....	70,050
Deliveries in August		8,974	.....	5,841	.....	8,266
Total eight months		60,568	.....	59,561	.....	77,408
Stock		72,841	.....	55,906	.....	44,956
Afloat	Peculs	17,000	.....	14,000	.....	21,000
Quotation, Aug. 31—Banca		57¼ fl.	.....	62 fl.	.....	54½ fl.
Billiton		56 fl.	.....	61½ fl.	.....	54¼ fl.

These combined returns of Banca and Billiton for 1883, compared with those for 1882, exhibit—An increase of the import for August of 164 tons; a decrease of the import for the eight months of 205 tons; an increase of the deliveries for August of 200 tons; an increase of the deliveries for the eight months of 84 tons; an increase of the stock second-hand of 520 tons; an increase of the unsold stock of 647 tons; an increase of the total stock of 1167 tons; a decline of the quotation of Banca of 7*l.* 18s. per ton.

The Government Returns for the month of June are as follows:—

EXPORT OF TIN FROM HOLLAND.

	June.			Six Months.		
	1883.	1882.	1881.	1883.	1882.	1881.
To Germany Tons	399	257	238	1902	1761	1779
England	17	20	12	63	56	275
Belgium	184	87	115	775	512	933
France	32	19	44	139	193	388
Hamburg	41	63	56	183	264	349
The United States	15	—	27	148	19	37
Other countries	45	40	111	138	129	306
Total	733	496	603	3348	2934	4067

Messrs. STRAUSS and Co. (London, Aug. 31) issue the following Statistics of Tin:—

	July 31, 1883.	Aug. 31, 1883.	Aug. 31, 1882.
Straits and Australian, spot Tons	4,533	4,350	6,196
,, ,, landing	416	320	170
Straits, afloat	700	570	100
Australian afloat	1,150	1,400	855
Banca, on warrants	1,380	930	938
Billiton, spot	2,316	2,276	1,747
,, afloat	853	1,062	885
Australian tin in Holland	—	—	10
Stocks in America, including quantity afloat	4,480	4,590	3,830
Total	15,828	15,498	14,731
Prices of Straits and Australian	£94 10	£93 15	£101 10
Deliveries during month in London	1,546	1,238	1,325
,, ,, ,, Holland	459	710	569
Total	2,005	1,948	1,894

Shipments during the month from Straits to London 400 tons, from Australia to London 850 tons, from London and Holland to America 129 tons, from Straits to America 925 tons, from Australia to America 100 tons. Banca in Trading Company's hands and afloat, 3388 tons.

THE COPPER TRADE.

Messrs. HENRY R. MERTON and Co. (Leadenhall-street, Aug. 31) issue the following Statistics of Copper:—

	1883.
Stocks in England and France:—	
Chili bars, Liverpool and Swansea Tons	23,334
Chili ingots, Liverpool and Swansea	491
Chili ores and regulus, Liverpool and Swansea (fine)	1,813
Other furnace stuff, Liverpool and Swansea (fine)	4,595
London, Foreign copper (chiefly Australian) and Landing	4,101
Havre and Bordeaux, Chilian and other bars	1,932
Havre and Bordeaux, other copper	585
Afloat, and chartered from Chili to England and France (advised by mail):	
Ores and regulus (fine)	1,006
Bars and ingots	6,612
By cable, ores and regulus (fine)	450
Bars and ingots	2,900
Afloat from Australia to London (advised by mail):—	
Fine copper	107
By cable: Fine copper	853
Total	48,729

Price of Chili bars, 64*l.* per ton.

Messrs. HARRINGTON, HORAN, and Co. (Liverpool, Aug. 31)—Chili copper charters for second half of August were advised to-day as 2100 tons fine, of which 600 tons bars and ingots, with 450 tons ore and regulus for England, and 1050 tons bars and ingots for Continent. Price of bars was $17·92, and exchange 35½d. During the past 14 days Chili bar copper gradually improved in value from 63*l.* 10s. to 64*l.* cash, and from 63*l.* 17s. 6d. to 64*l.* 10s. with extended prompt. Market to-day is quietly steady at the highest prices paid. The demand for manuiactured copper and yellow metal is on the increase, and considerable sales have been made for home consumption and for export. The sales of furnace material comprise:—At Liverpool—450 tons ruby and 1140 tons yellow Quebrada ore at 12s. 3d. and 12s. per unit respectively; 514 tons Peruvian ore at 12s. 6d., and 500 tons Betts Cove ore at 12s. per unit. To arrive at Liverpool, 326 tons Betts Cove regulus at 12s. 1½d.; 900 tons Rio Tinto regulus at 12s. 4½d.; 80 tons Canadian regulus at 12s. 3½d.; 408 tons Italian ore at 11s. 9d.; 120 tons Sardinian ore at 11s. 10½d.; and 11 tons Lisbon ore at 12s. 3d. per unit. At Swansea—450 tons Cape ore at 12s. 6d.; 250 tons Norwegian ore, to arrive, at 12s. 1½d.; and 1160 tons Italian ore, also to arrive, at 11s. 10½d. per unit. Precipitate—200 tons rich Rio Tinto at 12s. 10½d., and 60 tons at 13s.; 200 tons ordinary Rio Tinto at 12s. 9d., and 200 tons inferior, to arrive, at 12s. 4½d.; 415 tons Mason's Spanish at 12s. 6d.; 200 tons English at 12s 9d.; and 9 tons Portuguese, to arrive, at 12s. 3d. per unit. Import of Chili copper during the past fortnight, 407 tons fine, against 1405 tons fine same time last year; delivery, 965 tons, against 1126 tons; import of other copper during the past fortnight, 1341 tons fine, against 1216 tons fine same time last year; delivery, 1895 tons, against 1114 tons. Arrivals here during the fortnight of West Coast S.A. produce—A. C. Bean, from Valparaiso, with 10 tons bars; Araucania, from Valparaiso, &c., with 297 tons bars and 100 tons ingots; Tropique, from Pisco, with 60 tons ores; Taria, from Pisco, with 29 tons ores; Mira Flores, from Pisco, with 425 tons tons ores. At Swansea—*nil.* Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—

	Ores.	Regulus.	Bars.	Ingots.	Barilla.
Liverpool	.....	455	16,869	451	—
Swansea	.....	3,573	6,465	—	—
Total	.....	4,028	23,334	451	—

Representing about 25,598 tons fine copper, against 26,156 tons 15th inst.; against 23,140 tons Aug. 31, 1882; 29,126 tons Aug. 31, 1881; 32,598 tons Aug. 31, 1880.

Stock of copper contained in other foreign ore and Spanish precipitate, 4595 tons fine, against 2457 tons Aug. 31, 1882. Stock of Chili bars and ingots in Havre, 2047 tons fine, against 3240 tons Aug. 31, 1882. Stock of Coro Coro Barilla in Havre, — tons, against 15 tons Aug. 31, 1882. Stock of copper other than Chili in Havre, 470 tons fine, against 355 tons Aug. 31, 1882. Stock of Chili copper afloat and chartered for to date, 13,855 tons fine, against 13,243 tons Aug. 31, 1882. Stock of foreign copper in London, chiefly Australian, 4100 tons fine, against 7346 tons Aug. 31, 1882.

Messrs. VIVIAN, BOND, and WATSON (Aug. 31) write:—COPPER: The particulars of Chili charters for the first half of this month came to hand on 16th inst., as 450 tons bars and ingots, and 450 tons fine in ores and regulus, for England 450 tons fine for the Continent, and for the second half they are advised to-day as 600 tons bars and ingots, and 450 tons fine in ores and regulus, for England, and 1050 tons fine for the Continent—total 2100 tons; price $17·92. Exchange, 35⅝. The market for Chili bars still remains quiet and prices are nominally unchanged, 63*l.* 15s. sharp cash being the closing quotation to-day. In furnace material the following sales are reported:—Here, 450 tons Ruby at 12s. 3d., and 1140 tons yellow Quebrada ore at 12s., 510 tons Peruvian ore at 12s. 6d., 500 tons Betts Cove ore at 12s. 6d., 326 tons Betts Cove regulus at 12s. 1½d., 900 tons Tinto regulus, low produce, to arrive at 12s. 4½d., 400 tons low Italian ore, to arrive at 11s. 9d., 80 tons Canadian regulus at 12s. 3½d., 11 tons Lisbon ore at 12s. 3d. Swansea—250 tons Norwegian ore, to arrive, at 12s. 1½d., 450 tons Cape ore at 12s. 6d., and 1150 tons Italian ore, spot and afloat, 11s. 10½d. Precipitate, 450 tons Tinto, various produces, at 12s. 9d. to 13s., and 200 tons low produce Tinto, to arrive, at 12s. 4½d.; 415 tons Mason's at 12s. 6d., and 250 tons English at 12s. 9d.

Messrs. JAMES LEWIS and SON'S (Sept. 1) write:—There has been very little change in the value of copper during the past month. Chili bars remained almost stationary, with very moderate transactions, until the 28th inst., at 63*l.* 7s. 6d. to 63*l.* 15s. for sharp cash and usual 14 days' parcels, and 64*l.* to 64*l.* 5s. for three months' prompt. During the past few days values have improved slightly as very little spot copper is offered for sale, and for what is offered at current rates buyers are soon found. On the other hand, sales of forward copper can only be made at a slight advance on what is paid for available parcels. Nearly all the bars in stock are now in a few hands, and it seems probable that ere long an effort will be made by the holders to attain a higher range of prices. Higher prices being obtainable for furnace material in Liverpool than in Swansea, two cargoes of New Quebrada ore, say, 3140 tons yellow of about 10 per cent. produce were sold at 12s., and 447 tons Ruby of about 16 per cent. at 12s. 3d. per unit, for delivery in Liverpool out of the stock lying in Swansea. On the 16th ult. the Chili charters were advised as 1400 tons fine, and those to the 30th ult. are cabled as 2100 tons fine—1050 bars, ingots, and furnace material for England, and 1050 bars for France. The arrivals from Chili have been 1065, and the deliveries 1712 tons, and from other countries 4484 and 9344 tons fine respectively. The arrivals here from the United States during the past month amount to 1390 tons fine, of which 1152 tons are in argentiferous ore and matte.

THE COAL TRADE.

Mr. J. R. Scott, the Registrar of the London Coal Market, has published the following statistics of imports and exports of coals into and from the port and district of London, by sea, railway, and canal, during August, 1883:—

IMPORTS.

By Sea.	Ships.	Tons.
Newcastle	175	164,288
Sunderland	102	76,764
Seaham	23	18,707
Hartlepool	46	22,863
Middlesborough	3	755
Scotch	8	1,969
Welsh	32	30,790
Yorkshire	14	2,596
Cumberland	—	—
Small coal & cind.	10	4,935
Colonia.	5	330
Total	423	323,997
Imports—1882	384	285,013

By Railway and Canal.	Tons. cwt
Lond. & N.-Western	149,407 18
Great Northern	90,578 0
Great Western	85,299 0
Midland	201,713 0
Great Eastern	62,860 14
South-Western	5,975 15
South-Eastern	1,970 14
Grand Junction Canal.	851 15
Total	598,656 16
Imports—1882	530,695 7

Comparative Statement, 1882 *and* 1883:

By Sea.	Ships.	Tons.
Jan. 1 to Aug. 31, 1883.	3234	2,525,527
Jan. 1 to Aug. 31, 1882.	3309	2,408,230
Increase—1883	—	117,297
Decrease—1883	75	—

By Railway and Canal.	Tons cwts
Jan. 1 to Aug. 31, 1883	4,516,379 15
Jan. 1 to Aug. 31, 1882	4,093,749 14
Increase—1883	422,630 1

EXPORTS.

Railway-borne coal passing "in transitu" through district	Tons	106,417
Sea-borne coal exported to British Possessions, or to foreign parts, or to the coast		62,099
Ditto sent beyond limits by railway		17,261
Ditto by canal and inland navigation		2,542 = 81,902
Railway-borne coal exported to British Possessions, or to foreign parts, or the coast		39,121
Ditto by rail beyond district		469
Ditto, by canal and inland navigation		148 = 39,738
Sea-borne coal brought into port, & exported in same ships		250
Total quantity of coal conveyed beyond limits of coal duty district during Aug., 1883		228,307
Ditto, during Aug., 1882		193,498

Comparative Statement, 1882 *and* 1883.

Total distribution of coal from Jan. 1 to Aug 31, 1883	1,864,194
Total distribution of coal from Jan. 1 to Aug. 31, 1882	1,750,049
Increase in the present year	114,145

General Statement, 1882 *and* 1883

Increase in coals imported by sea during the present year	117,297
Increase in coals imported by railway and canal	422,630 = 539,927
Less increase in coals exported	114,145
Total increase in trade within the London district during present year	425,782

IRON.—Messrs. BROOKER, DORE, AND Co. (Sept. 1) write:—Scotch Pigs: During the whole of August there has been a steady demand for shipment, but in the absence of speculative enquiry, warrants have slightly receded and are now quoted at 46s. 11½d. per ton. A fairly hopeful feeling prevails as to the future, and it is thought that the market will assume a healthier tone when the holiday season is over. Unless, however, production is lessened and stocks are reduced, we do not look for any important rise in price.—Finished Iron: The strike of the men in South Staffordshire having terminated, the works there are all busy on orders in arrear, but there is not much fresh business stirring. Prices remain unchanged in every branch of the trade.—Baldwin's Iron in steady demand at list prices.—Galvanised Iron: The makers have experienced some difficulty in getting supplies of black sheets during August, and have, therefore, not been able to work full time continuously. Stocks in England, of both black and galvanised sheets, must have been materially reduced recently, and if a spurt should set in, with a large demand for prompt shipment, makers will not be able to meet it immediately. The recent advance is maintained by the best makers, but some of the manufacturers of commoner quality are still selling at prices needlessly low, and which must leave them a loss.

PROVINCIAL STOCK AND SHARE MARKETS.

CORNISH MINE SHARE MARKET.—Mr. S. J. DAVEY, mine share-dealer, Redruth (Sept. 6), writes:—Our market this week has again been very quiet, and prices have not much altered. Dolcoaths declined to 65½ 66, in face of to-morrow's (Friday) sale of 201 new shares. Subjoined are the closing quotations:—Blue Hills, ⅛ to ¼; Carn Brea, 6 to 6¼; Cook's Kitchen, 24 to 26; Dolcoath, 65½ to 66; East Pool, 41½ to 42; Killifreth, 35s. to 40s.; New Cook's Kitchen, 3 to 3⅛; New Kitty, 2 to 2⅛; North Penstruthal, 9s. to 11s.; Penhalls, ⅛ to ⅜; Pedn-an-drea, ⅜ to 1; South Condurrow, 8 to 8¼; South Crofty, 6 to 7; South Tolcarne, 4½ to 5; South Frances, 9 to 9¾; Tincroft, 6½ to 6¾; West Basset, 4½ to 5; West Frances, 2 to 2⅛; West Kitty, 13 to 13⅛; West Peevor, 3¼ to 3⅜; West Polbreen, ⅞ to 1⅛; West Poldice, ⅞ to 1⅛; West Tolgus, 9 to 11; West Seton, 10 to 12; Wheal Agar, 14 to 14½; Wheal Basset, 4 to 4⅛; Wheal Grenville, 6 to 6⅛; Wheal Peevor, 3 to 3⅛; Wheal Kitty, 1¼ to 1⅜; Wheal Uny, 2¼ to 3; Wheal Coates, ¼ to ⅜; Trevaunance, 2⅝ to 3; South Penstruthal, 1¼ to 1⅞; East Uny, ½ to ¾.

— Messrs. ABBOTT and WICKETT, stock and share brokers, Redruth (Sept. 6), write:—Only a limited business doing this week. Dolcoaths close weaker, and opinions vary as to the result of to-morrow's sale of 201 shares. East Pools, West Kittys, Camborne Veans, and Cook's Kitchens enquired for at current rates. Closing quotations herewith:—Blue Hills, ½ to ⅝; Camborne Vean, ⅛ to ¼; Carn Brea, 5⅛ to 6; Cook's Kitchen, 25 to 26; Dolcoath, 66 to 66⅜; East Pool, 41⅛ to 42; Killifreth, 1⅝ to 1⅞; New Cook's Kitchen, 3 to 4; New Kitty, 1⅞ to 2; New Trumpet, 1 to 1¼; Pedn-an-drea, 1 to 1⅛; South Condurrow, 8 to 8¼; South Crofty, 7⅛ to 8; South Wheal Frances, 9 to 9¼; Tincroft, 6¼ to 6¾; West Basset, 4⅛ to 5; West Kitty, 13 to 13⅛; West Peevor, 3⅛ to 4; West Frances, 2 to 2⅛; West Tolgus, 10 to 12; West Seton, 12 to 14; Wheal Agar, 14 to 14½; Wheal Basset, 4 to 4⅛; Wheal Grenville, 6 to 6⅛; Wheal Kitty (St. Agnes), 1 to 1¼; Wheal Peevor, 3 to 3⅛; Wheal Uny, 2¼ to 3.

— Mr. M. W. BAWDEN, Liskeard (Sept. 6), writes:—The mining market continues dull and inanimate, although the tin standard has shown a steady improvement, and every probability of a further advance, it has not as yet had any beneficial effect on the price of shares. At Pedn-an-drea United Mines a good improvement has taken place at the 100 fm. level west valued at 25*l.* per fathom. Subjoined are the closing quotations:—Bedford United, 1⅜ to 1½; Carn Brea, 6 to 6¼; Cook's Kitchen, 25 to 25½; Dolcoath, 64 to 65; Devon Consols, 2⅞ to 3; Devon Great United, 1s. to 1s. 6d.; East Caradon, ½ to ⅝; East Lovell, ⅛ to ¼; East Pool, 42 to 42½; Gawton United, ⅛ to ¼; Glasgow Caradon, ½ to ⅝; Gunnislake (Clitters), 1 to 1½; Herodsfoot ⅛ to ¼; Hingston Down, ¼ to ⅜; Killifreth, 2 to 2¼; Marke Valley, ⅞ to 1; New West Caradon, ¼ to ½; Old Gunnislake, ¼ to ⅜; Phœnix United, 2 to 2¼; Prince of Wales, ¼ to ⅜; South Caradon (Limited), fully paid, 1 to 1⅛; South Condurrow, 8 to 8¼; South Crofty, 8 to 8¼; South Devon United, ¼ to ⅜; South Frances, 8¾ to 9; Tincroft, 6¼ to 6¾; Tregurtha Downs, 1 to 1⅛; West Basset, 5 to 5⅛; West Caradon, ½ to ⅝; West Kitty, 12½ to 12¾; West Mary Ann, ¼ to ⅜; West Phœnix, ¼ to ⅜; West Crebor, ⅛ to ¼; Wheal Agar, 14 to 14½; Wheal Crebor, 2 to 2⅛; Wheal Grenville, 6 to 6¼; Wheal Hony and Trelawny, 1 to 1¼; Wheal Kitty, 1 to 1⅛; Wheal Jane, ½ to ⅝; Wheal Peevor, 3¼ to 3⅜; Wheal Uny, 3¼ to 3⅜; North Herodsfoot, ⅛ to ¼.

— Mr. JOHN CARTER, mine sharedealer, Camborne (Sept. 6), writes:—There is scarcely any change to notice in the share market this week. Dolcoaths have been easier in face of the approaching sale of 201 shares by auction on the 7th inst. Subjoined are the closing quotations:—Carn Brea, 5⅝ to 6; Cook's Kitchen, 22 to 24; Dolcoath, 65½ to 66½; East Pool, 41¾ to 42¼; Killifreth, 1¾ to 1⅞; Mellanear, 3 to 3¼; New Cook's Kitchen, 2¾ to 3¼; New Kitty, 2 to 2⅜; Pedn-an-drea, ⅛ to ⅜; Penhalls, 4s. to 6s.; South Condurrow, 7¾ to 8⅛; South Crofty, 7 to 7⅛; South Frances, 8¾ to 9; Tincroft, 7 to 7⅛; West Basset, 4¾ to 5; West Frances, 1⅝ to 2; West Kitty, 13¼ to 13⅝; West Peevor, 3¼ to 3⅜; West Poldice, ⅜ to 1; West Seton, 10 to 12; Wheal Agar, 14 to 14½; Wheal Basset, 5 to 5¼; Wheal Grenville, 6¼ to 6½; Wheal Kitty, 1¼ to 1⅜; Wheal Peevor, 3¾ to 3⅞; Wheal Uny, 2¼ to 3.

MANCHESTER.—Messrs. JOSEPH R. and W. P. BAINES, share brokers, Queen's Chambers, Market-street (Sept. 6) write:—The markets have exhibited some activity during the past week, but the bulk of the business has been centred in a few stocks to which attention has been prominently attracted. Early in the week the course of prices appeared to be upward, but this soon disappeared, and since values have declined all round on threatened hostilities between France and China, and the very unseasonable and stormy weather at home as elsewhere. The chief feature in alterations in prices is the continued heavy fall in Mexican railway stock, which has, with but slight and very temporary rallies, been sold down to 93, to-day's closing prices, compared with those ruling on Thursday evening last, showing a decline of nearly 16 per cent. Foreign stocks have joined in the general depreciation, but the fall is in no case severe except for

Mexican Threes per Cents., which mark 2⅜ down. Russian are ¾, and Spanish ⅝ to ¾ lower. Egyptians little lower. Argentine Public Works stock is the only one which mark better, being quoted ½ up. Miscellaneous classes on the whole continue very dull, with a slight general adverse balance of movements in values.

BANKS are still to the front with transactions, dealings being recorded in most cases at about recent quotations. Local concerns somewhat irregular, showing no general tendency.—Higher: Manchester and Liverpool District ⅛ to ¼, and Manchester and County ⅛.—Lower: National Provincial ⅛; ditto, new, ⅛; Consolidated, ⅛; and Union of Manchester, ¼.

INSURANCE.—Not till to-day, when a solitary transaction each in Thames and Mersey Marines and Lancashires was marked, was any business recorded herein. Prices have changed very slightly, but what changes have occurred are adverse, Royal Liverpool being ¼, Maritime ⅛, and British and Foreign Marine ⅛ lower.

COAL, IRON, &c., AND MINING.—Solitary markings in Bolckow's fully-paid and and 12*l.*-paid and Ebbw Vales and West Cumberland comprise the whole of the business done.—Higher: Staveley Coal, &c., A, 1¼; Sheepbridge Coal, &c., C (21*l.*-paid), ¾; John Browns, ¾ to ¼; Tharsis Sulphur and Copper, ⅛.—Lower: Bolckows (12*l.* paid), ⅛ to ¼; Ebbw Vale, ⅛; Chatterley Iron, ¼; and Sheepbridge Coal, &c., A, ⅛.

COTTON SPINNING, &C.—The condition of the spinning and weaving trades being so unsatisfactory, this market continues depressed. There is little or no public demand for shares, and sellers predominate, buyers, except at further reduced prices, being very scarce. Prices generally lower, and still drooping.

TELEGRAPHS.—No business reported, and a rise of ¼ in Anglo Preferred, and ⅛ in Globe Preferred are all the changes marked.——TELEPHONES.—Little doing; National ⅛ better, Uniteds ¼ lower.——CORPORATION STOCKS, &c.—Only a few lots passing. Sellers of Blackburn 4 per cents. quote 1 lower, buyers' figure being unchanged. Manchester Stock is ⅛ to ¼ higher, and Leeds Consolidated Debentures ¼ to ⅛ down.——MISCELLANEOUS.—Fairly steady, with no feature calling for comment.

RAILWAYS.—Some decided changes are to be noted. In the beginning of the week an important improvement occurred; but as the difficulties between France and China were enlarged upon, and the weather became so unpropitious, with other disturbing elements, prices fell away, and, with one or two exceptions, all are lower. The Caledonian dividend of 4 per cent., with 11,000*l.* surplus, being same in both respects as last year, assisted their value; but they have since lost 1 per cent. from the best point. Metropolitan Districts rose 3½ per cent. on good traffic, attributable to visitors to the Fisheries Exhibition; but they have also fallen away from the highest reached. In Canadians the Grand Trunk traffic of to-day (7754*l.* increase) brought in some steadiness; but the delay in the dividend announcements causes uneasiness, and consequently fluctuations. Americans decidedly higher on the week; but show weakness to-night. Mexican rails have been heavily sold, and though after so severe a decline, it is reasonable to expect a reaction. The "bears" are persistent, and for the present have the best of it, the traffic return announced to-day (10,000*l.* increase) helping the movement.

NEWCASTLE-ON-TYNE.—Mr. S. N. CHALLONER, stock and share broker, Grey-street (Sept. 6), writes:—Sir W. J. Armstrong-Mitchell's shares are higher at 120. Palmer's firmer, A at 28½; B at 20 (cum. div. of 35s. on A, and 25s. on B shares). The profits for the past year are stated to be from 140,000*l.* to 160,000*l.* It is understood that 50,000*l.* to 60,000*l.* will be added to the reserve fund, which now stands at 60,000*l.* Bede Metal are flat at 16; Bolckow fully paid at 20½, and 12*l.* paid at 11¾ to 12¼; Tees Side Iron Ordinary at 1⅝, and Preference at 1¾ to 1⅞; West Cumberland Iron are a shade firmer at 8. Consett Water are ⅛ higher at 5⅞ to 6 ex. div.; Newcastle Gas 2 at 174 ex. div.; and Water at 173 ex. div; Hartlepool Gas and Water shares are in demand, A at 8¾, B at 7½, and C at 7¾; Langdale at 3¾ ex. div.; Lawes at 5¾ ex. div.; Newcastle Chemicals at 32s. 6d. A rise of 10s. per share on the better prospects of the chemical trade. Furness Railway 2½ down to 121. Hull Barnsley ⅝ to 6, 6½.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—Mr. J. GRANT MACLEAN, stockbroker and ironbroker (Sept. 6), writes:—During the past week markets have remained quiet, but the tendency of prices is favourable, owing to the easy state of the money market, the quiet state of politics, and fine harvest weather, which is expected to have a favourable influence on trade this autumn.

In shares of coal, iron, and steel companies prices are steady. Clyde Coal advanced to 71s., but are now easier, about 69s. Chapel House offered. Cardiff and Swansea, 50s.; Marbella, 61s. to 64s.; and Omoa and Cleland, 15s. to 18s.

In shares of foreign copper and lead companies prices have improved. Tharsis have improved from 6⅜ to 6*l.* 11s. Bratsberg, 47s. 6d. to 52s. 6d.; Corporation of South Australia, 7s. 6d. to 12s. 6d.; Montana, 10s. to 12s. 6d.; Souback and Catir Alan, 10s. to 15s.

Shares of home mines are dull. Cambrians are at 3s. 9d.; Collacombe, 2s. 6d. to 3s. 9d.; Conway Valley, 6s. 3d.; Caron, 1s. 6d.; Carn Camborne, 17s. 6d. to 20s.; East Blue Hills, 4s. to 6s.; East Craven Moor, 5s. to 7s. 6d.; East Wheal Rose, 10s. to 12s. 6d.; Goginan, 5s. to 7s. 6d.; Leadhills, 50s. to 55s.; New Cambrian (preference), 3s.; Mona Consols, 7s. 6d. to 12s. 6d.; Mounts Bay, 3s. to 5s.; North Molton, 2s. 6d. to 5s.; Old Shepherds, 7s. 6d. to 10s.; Old Gunnislake, 2s. to 4s.; Rhosesmor, 40s. to 50s.; St. Just United, 96s.; Tregontrees and Old Polgooth, 6s.; Tamar, 8s. 9d. to 11s. 3d.; Tresavean, 7s. to 8s.; Tankerville, 2s. 6d. to 4s.; Trebartha Lemarne, 6s.; West Frances, 40s. to 50s.; Wheal Jane, 5s. to 10s.; and Wheal Lusky, 2s.

In shares of gold and silver mines business continues quiet. New Emmas are expected to improve. Great Zarumas wanted. Akankoos are at 5s. to 7s. 6d.; Apollonia, 35s. to 45s.; Asia Minor, 7s. 6d. to 12s 6d.; Chontales, 6s. to 8s.; Crookes, 20s. to 25s.; Gold Hills, 2s. 6d. to 5s.; Indian Kingstons, 1s. 3d.; Isabelles, 5s. to 10s.; New Gold Run, 2s. 6d. to 5s.; Organos, 10s. to 15s.; Orita, 12s. 6d. to 17s. 6d.; Potosi, 11s. 3d. to 13s. 9d.; Ruby, 27s. 6d. to 32s. 6d.; Tolima A, 5¼ to 5¾; and Victoria, (Venezuela), 10s. to 12s. 6d; Colombian Hydraulic, 4s. to 6s.

In shares of miscellaneous companies the principal feature is an advance in oil shares, owing to the satisfactory reports of that trade and the decrease in the American production. Nobel's Explosives declined from 27 to 23½, but are now about 26. Schwab's Gully Diamond offered. Home Mines Trust, 9s. to 10s.; and Lawes' Chemicals, 6 to 6½.

EDINBURGH.—Messrs. THOS. MILLER and SONS, stock and share brokers, Princes-street (Sept. 5), write:—Since last report North British and Edinburgh and Glasgow stocks have been favourably influenced by their dividends. Caledonians also improved, and a further advance was given to the stock by the announcement of 4 per cent. dividend for the past half-year. Grand Trunk stocks have been changing frequently on dividend expectations. Arizonas have shown some improvement. Since Wednesday last week Caledonian has risen from 103⅜ to 105⅝, Great North from 57 to 57⅞, North British from 101¾ to 102¾, Edinburgh and Glasgow from 38⅞ to 40, Eries have advanced from 30 to 31⅛, Oregon Preference from 36¼ to 37¼, Readings from 26 to 26⅞: deferred from 8⅜ to 8⅝, Arizona Copper have gone from 41s. to 43s., Clyde Coal from 65s. to 67s. 6d., Burntisland Oil from 23¾ to 24, Midlothian from 12¾ to 12⅝, Uphall from 9 1/16s to 10 1/16s, Young's from 11⅞ to 12 3/16s.

RISH MINING AND MISCELLANEOUS COMPANIES SHARE MARKET.

CORK.—Messrs. J. H. CARROLL and SONS, stock and share brokers, South Mall (Sept. 5), write:—Markets were steady to-day. Great Southerns rose to 120½ to 120¾, Midlands 86¾, National Banks were dealt in at 24⅛, Provincials at 31⅜, and Hibernians at 26¼, Munsters 6½, buyers, Alliance Gas 19⅜, Cork Gas 7, Cork Packets remain 11 9-16ths, Gouldings are 8 15-16ths, and Lyons unaltered.

DISTILLATION OF COAL.

It has hitherto been proposed to distil coal in presence of a partial vacuum, but such partial vacuum has been employed either for the purpose of quickly removing the evolved vapours from the distilling apparatus or of getting these off at a lower temperature than would be necessary were such partial vacuum not employed. It has also been proposed to separate various substances or products from their mixed vapours in a certain degree of purity by passing the vapours through a series of condensers each of which is kept at a temperature lower than its predecessor in the series. The method of endeavouring to separate various substances or products from their mixed vapours by passing these vapours through a series of condensers, each of which is kept at a temperature lower than its predecessor in the series has not been used together with the use of a partial vacuum.

As an improvement upon these processes Mr. EDWIN DREW, of Queen's-road, Bayswater, proposes a method which consists in passing the mixed vapours from coal through a series of condensers, each of which is maintained at a temperature lower than its predecessor in the series and at the temperature which in each case is adapted to the condensation of the required product, and at the same time reducing considerably the pressure within the series of condensers by the application of a suitable air-pump or exhauster, and he uses and adapts this exhaust or partial vacuum for the purpose of increasing the differences between the vapour tensions of the various vapours as they pass through the series of condensers referred to, and so facilitating very much their separate condensation in the condensers under the influence of the respective temperatures at which the condensers are maintained. He does not confine himself to any exact degree of exhaust, but he finds it advantageous to work with as high an exhaust as can be maintained economically and practically in connection with the construction and working of the apparatus. It is also advantageous to cause the vapours on entering into any condenser in the series to impinge closely upon or even to bubble through any fluid which has been already collected.

PUBLIC COMPANIES, FROM THE CRADLE TO THE GRAVE.

From the character of the title, the intending reader would naturally expect to find either something instructive or something funny in the pamphlet to which it is prefixed; but long before he reaches the end he will, assuming, of course, that he has had some experience of commercial and industrial matters, congratulate the author upon his good judgment in avoiding the disclosure of his name, and may possibly ask himself whether the said author is the more ignorant of business or of law. Not only is the pamphlet as regards its facts a mere compilation which could have been made from a single volume with which most business men are acquainted, and with a few hours' labour, but the substitute for English used by the author in expressing his views is coarse and vulgar, perhaps because he has attempted to be humourous, though he evidently does not possess a grain of humour, and suffers acutely from a disordered liver, due it may be to his having speculated injudiciously, and lost his money. It has grown by far too much a custom to assume that all who part with their cash are necessarily defrauded unless they receive handsome and regular interest at a high rate, and it is not considered whether the loss of capital is due to a grocer trying to make chronometers, or to the chronometer maker trying to make boots. Even looking at the pamphlet itself there is evidence of the author's attempt to dabble with other men's business. The printers and publishers are Messrs. Wyman and Sons, of Great Queen-street, and the type and paper used are excellent; but there is a mannerism throughout—italics and small capitals misplaced, and so on—which shows that the author supposed he knew more of printing than men who have learned the trade.

It has been frequently urged in the *Mining Journal* that overdrawn prospectuses are seldom prejudicial except to those who are not deceived by them, but who take shares with the sole object of reselling them at a profit, and in nine cases out of ten it is the sharedealing middleman who deceives the *bona fide* purchaser of rubbish far more than the vendor or his over-sanguine prospectus. The pamphlet is divided into 14 chapters, but as the first 13 contain little of anything new or useful, the last chapter, the suggested reforms, may be at once referred to, more especially as it is in this chapter that the nearest approach to real humour is found. It is quite evident that the author does not understand the case nor its requirements; but there is an advantage in this—had he possessed more knowledge of the subject he could not have made such amusing observations. As there are only nine suggestions, they may be referred to in detail. He offers no arguments in support of them. His first suggestion is "that registration of a company should not take place simply as a matter of form, but be preceded by a preliminary investigation by the Board of Trade to see at least that the directors, promoters, engineers, and other officers really exist, and that they are acting in good faith." Now, as to the real existence of directors, promoters, engineers, and other officers, there is never the slightest doubt about it, so that investigation would be unnecessary, and the attempt to ascertain that they are acting in good faith would be useless, since even in the cases of the few palpable frauds which have been exposed in connection with the formation of public companies, there has been but one instance where identity of the vendor and purchaser has been proved or even alleged. So long as those necessary operations of buying and selling go on, so long must buyers and sellers be left to make their own bargains, and be compelled to accept the result. It would be impracticable to enact a law that "two or more persons shall *not* combine to provide funds for carrying on any industrial or commercial undertaking," and if they be permitted to combine they must have power to appoint some one to manage the business. Whether this appointment be made by lending money to an individual carrying on the business, and accepting a fixed rate of interest for the use of that money, or by relying upon a board of directors to superintend the business, rests entirely with the capitalist; but most persons prefer the ignorance of directors to the knowledge of the individual manager because they suppose that the directors, being removable, give themselves more control. On the Continent it is a very common practice to remunerate directors by giving them a proportion, usually 20 per cent., of the divisible profits; but this necessitates giving the directors permanent right to their seats, otherwise a practical and business-like board might, after developing a concern to success, be replaced by incompetent noodles nominated by the shareholders, and having nothing to do but receive the fruits of their predecessors' labours. Englishmen, again, are the least scrupulous of any nation in varying a contract as soon as they find that the contractor is deriving profit from it. Purchasers of shares too often act upon the theory that they are entitled to all the rights belonging to them, but that they should not be expected to accept the responsibilities—they wish rights to be perpetual, but liabilities to be extinguished on the death or removal of those who incurred them.

The pamphleteer next wishes section 6 to be remodelled, so that it shall be necessary to show who the directors and promoters are, and the extent of their interest in the undertaking. The objection to this suggestion is that the provision would mislead by creating an apparent security where none exists, just as the reliance now too often placed on professional auditors and accountants enables the most rotten concerns—such as under the older system of audit by shareholders and men of business would have been placed in liquidation long previously—to be carried until the assets are totally exhausted. It is well known that so long as a payment is to be made for a property or business, it is quite impracticable to ascertain the original source of the money which pays for the directors' shares, and if it were enacted, for example, that the directors should hold 5 per cent. of the company's capital, it would simply be necessary for the vendor to demand a larger proportion of the purchase money in cash, so that the amount might be handed over to the directors to reimburse them for the amount paid for their shares—in fact, this is very commonly done at present. It must be remembered that the principle of preliminary and complete registration was adopted in the Joint-stock Companies' law which preceded the Limited Liability System, and was proved to be worthless, and to afford no additional protection to the capitalist. The third suggestion displays such childish innocence of ordinary business dealings and of everything relating to companies that it is almost cruel to the author to refer to it. He proposes—"that before registration directors and promoters be individually required to deposit an aggregate sum, equal to a small percentage (say, 2½ per cent.) of the total capital asked as a guarantee of good faith. Also that at least one-half of the cash payments to be paid to promoters be set aside until the results of operations show whether their charges were exorbitant, or the patent, or business, or mine disposed of as valueless. The same to be deposited at interest in a bank, and to be at the order of the Board of Trade until two years after the company was started, and to be forfeited to the member if any fraud is proved."

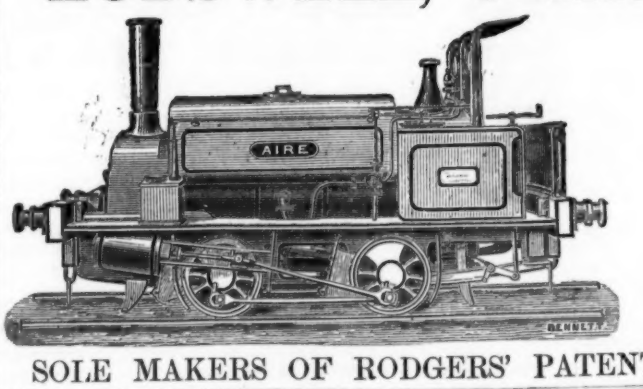
The unreasonableness of this suggestion will be most readily shown by taking a parallel case. Let us assume that the author of the pamphlet is a chandler's shopkeeper or a tailor, and ask him whether he would have considered it just to have required him to deposit with the Board of Trade 2½ per cent. of the capital which he estimated he would require to purchase and carry on his business, or of the capital represented by the value of the goods he would receive on credit from his woollen draper. Secondly, would he consider it reasonable that his customer purchasing groceries, soap, and candles, or a suit of clothes of the value of 5*l.* should, instead of paying the said shopkeeper or tailor for the goods bought, place 2*l.* 10s. in a bank to remain at the order of the Board of Trade until two years after the date of sale, and then paid to the customer if the articles purchased shall have proved unequal to said customer's expectations. Assuming that the pamphleteer considers this reasonable, the question arises—why should the country be required to pay additional taxes to provide the salaries of extra Board of Trade officials to act as guardians of persons who are incompetent to take care of themselves, when we have already such an abundance of lunatic asylums and such great facilities for securing protection to the weak minded.

The remaining suggestions display an equal want of knowledge as to what is done at present, and what is required by the more intelligent portion of the public—by those who are ready to assist in the development of industry without expecting an impossible percentage of profit, or seeking to speculate as shareholders without taking speculators' risks. He proposes "that all directors be held liable for the honesty of the company's transactions, and for false or misleading statements in the prospectus." The answer to this is that directors are already liable for false and misleading statements in the prospectus, and that honesty not being criminal, no liability is involved by practising it. Next he suggests "that no company shall be permitted to proceed to allotment unless two-thirds of the capital offered to the public was *bona fide* applied for, and that (after payments provided for promoters) the funds available will permit of the company's objects being carried on with some prospect of success? The suggestion that a certain percentage of the capital should be subscribed before allotment is old and good. The latter part of the suggestion is useless, as every purchaser of a share will have his own idea as to prospects of success. No legislation would prevent the promoter of a scheme for establishing a daily balloon post between London and New York from obtaining monetary support of a certain class of speculators, yet these are the first to complain when they receive no interest for their money. Again, the author suggests "that where the directors' remuneration is fixed by the Articles of Association (presumably prepared under the directors' instructions) it should be seen that the sum stated will not in a few years swallow up all the funds." The only reasonable method of adopting this suggestion would be to pass a law that "every purchaser of a company's share who fails to read previously the said company's Articles of Association shall be fined 5s., as though drunk and incapable." There would be no hardship in this, as the present law enables everyone to obtain a company's Articles of Association for 1s.

The suggestion "that when a blank occurs in the directorate the appointment shall not be filled up by the remaining directors, but by the members, and that all directors resigning shall clearly explain their reasons at a public meeting of the company, and give security to appear and answer all charges when called upon" is unnecessary, since any company preferring so stupid an arrangement could obtain it in a month by passing the requisite special resolution. And, lastly, the proposal "that the whole method of granting proxies be reconsidered, so that directors, their nominees, and others *(sic)* be not allowed to override the results of discussions entered into at the companies' meetings by those who, having attended, are best able to decide on the question discussed" is of no practical utility, inasmuch as it is an indisputable fact that the large majority of those who attend public meetings rely upon what they hear there instead of upon the detailed reports of the officers for their knowledge of the company's position and prospects, and that many who speak simply do so to bring forward their own crotchets, or to secure some of the fees of management, regardless of their ignorance both of the company's affairs and of business generally. In fact, they delight in the sound of their own voice, and care little who suffers from the infliction of their nonsense. On the other hand, in determining to whom a proxy shall be given, the shareholder is compelled to give at least some attention to the subject, so that his vote is more likely to be conducive to the welfare of the general body of shareholders. It is hoped that enough has now been written to show that the author of the pamphlet has attempted a subject about which he knows nothing, and has lamentably failed.

ESTABLISHED 1860.

HUDSWELL, CLARKE, AND CO.,
LEEDS.



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MANUFACTURERS OF
MINING STEEL of every description.
CAST STEEL FOR TOOLS. CHISEL. SHEAR. BLISTER, & SPRING STEEL
MINING TOOLS & FILES of superior quality.
EDGE TOOLS, HAMMERS, PICKS, and all kinds of TOOLS for RAILWAYS, ENGINEERS, CONTRACTORS, and PLATELAYERS
LOCOMOTIVE ENGINE, RAILWAY CARRIAGE and WAGON SPRINGS and BUFFERS.
SHEAF WORKS AND SPRING WORKS, SHEFFIELD.
LONDON OFFICES—90, CANNON STREET, E.C. PARIS DEPOT—15, RUE DES ARCHIVES. BOSTON, MASS., U.S.—40, KILBY STREET.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

H. D. POCHIN AND CO. (Limited).—Capital 110,000*l.*, in shares of 20*l.* To acquire and carry on a business of manufacturing chemists, drysalters, china-clay manufacturers, &c. The subscribers are—H. Pochin, Denbigh, 2000; H. D. Pochin, Salford, 300; W. Pochin, Salford, 300; A. Pochin, Denbigh, 30; L. E. McLaren, Barnes, 30; C. McLaren, Barnes, 30; J. Wadsworth, Salford, 1.

HERTS AND ESSEX WATERWORKS COMPANY (Limited).—Capital 25,000*l.*, in shares of 10*l.* The usual business in all branches of a waterworks company. The subscribers (who take one share each) are—A. Simmonds, South Norwood; J. M. Brett, 19, Albert Mansions; F. J. Oswin, 10, Gower-street; F. H. Hendré, 55, Charlwood-street; A. J. Russell, Plumstead; F. H. Anson, 24, Vincent-square: M. W. B. Ffokes, 26, Green-street.

THE BIRMINGHAM ARTIZANS' DWELLINGS COMPANY (Limited).—Capital 100,000*l.*, in shares of 5*l.* To purchase or otherwise acquire lands, buildings, &c., for the purpose of carrying on all operations of a local building society. The subscribers (who take one share each) are—J. Cartland, Birmingham; W. M. Ellis, Birmingham; T. S. Fallows, Birmingham; J. D. Goodman, Edgbaston; J. S. Hopkins, Edgbaston; J. Jacobs, Birmingham; W. Kerby, Handsworth; J. B. Stone, Erdington.

THE ANGLO-MEXICAN MINING COMPANY (Limited). — Capital 325,325*l.*, in shares of 5*l.* and 1*l.* To acquire the Yedras Silver Mine and the ranche known as "Valgame Dios," respectively situate in the State of Sinalva, Mexico, and any other property which it may seem desirable to acquire in connection therewith, for the purpose of carrying on the business of miners and metallurgists in all branches; also of ranche proprietors and agriculturists, and any other businesses calculated to enhance the value of any of the company's properties. The consideration of purchase of the above is 280,325*l.*, of which 200,000*l.* is payable in cash and the balance in fully paid-up shares. The subscribers (who take one share each) are—G. Hopkins, 30, Parliament-street, C.E.; W. Lloyd, 19, Finchley-road, C.E.; H. Hopkinson, 78, Holland-road, Major-General; W. H. O'Shea, Albert Mansions, M.P.; J. H. Gibbs, 24, Lexham Gardens, gentleman; Lord George Hamilton, 17, Montagu-street, M.P., C. King, 8, Bolton-street, geologists. The board is constituted as follows:—G. Hopkins, W. Lloyd, H. Hopkinson, W. H. O'Shea, Lord George Hamilton, J. H. Gibbs, C. King, and D. Fergusson; the number must not be less than three or more than nine.

J. A. WINK AND COMPANY (Limited).—Capital 10,000*l.*, in shares of 50*l.* To manufacture, sell, and deal in all manner of chemical products, alkalis, &c. The subscribers (who take one share each) are—B. Dickenson, Bourne End; T. Mosley, Finchley; C. Kennedy, Erith; F. Jordan, Erith; J. Turner, Chester; H. R. Turner, Queen's Ferry; T. Rouch, 65, Fenchurch-street.

THE UNIVERSAL HIRING AND SUPPLY ASSOCIATION (Limited).—Capital 50,000*l.*, in shares of 1*l.* To buy, sell, let, or otherwise deal and trade in furniture, pianos, sewing machines, &c. The subscribers are—F. Howard, 53, Prince's-terrace, 1; H. A. Hart, Long Ditton, 1; F. S. Guy, Kingsland, 1; G. Leggett, 115, Finsbury Pavement, 1; E. J. Stone, Brighton, 50; W. Treusinen, 7, Great Sutton-street, 50; G. D'Arcy, 12, Old Jewry, 50.

THE CROWN PUBLISHING COMPANY (Limited).—Capital 50,000*l.*, in shares of 5*l.* The business of general publishers, printers, news-agents, stationers, &c. The subscribers are—E. Smith, 11, Kirby-street, 152; R. H. Squire, 136, St. John's-road, 100; W. C. Perraton, Hornsey Rise, 65; F. H. Perraton, Wood Green, 55; G. H. Barker, 52, Fleet-street, 10; G. H. Squire, 39, Marchmont-street, 2; W. R. Skinner, 73, Isledon-road, 1.

EAST KILLIFRETH TIN MINE SYNDICATE (Limited).—Capital 6000*l.*, in shares of 1*l.* To acquire a mine situated in the parish of Kenyan, Cornwall, and any other mineral property, setts, licenses, machinery, plant, and material, or mining rights in said county or elsewhere in England and Wales. The developing and working of mines or minerals, the sale of ores and other products, and the carrying on of all operations connected with a mining company. The subscribers (who take one share each) are—R. Macdonald, Walthamstow, stockbroker; W. Wren, Chadwell Heath, gentleman; J. S. Carter, Poplar, manufacturer; J. Campbell, East Dulwich, gentleman; A. Wallace, Cricklewood, merchant; J. Moss, Cliftonville, gentleman; P. R. Stamper, Selhurst, clerk. The first directors will be appointed by the subscribers. Remuneration 150*l.*, subject to future augmentation, to be divided.

THE WALTON PARK HOTEL COMPANY (Limited). — Capital 30,000*l.*, in shares of 10*l.* To acquire land adjoining Clevedon for the purpose of erecting and maintaining thereon hotel or hotels. The subscribers (who take one share each) are—H. Daniel, Bristol; C. Godwin, Stoke Bishop; H. Murray-Herbert, Junior Oxford and Cambridge Club; J. M. Dunlop, Bristol; P. Munro, Bristol; W. W. Wallis, 14, Holtham-road; F. Phillips, Brighton.

MARRIOTT AND ATKINSON (Limited).—Capital 32,000*l.*, in shares of 10*l.* To purchase, take over, and carry on an iron and steel maker's business, established at Sheffield. The subscribers (who take one share each) are—C. F. Atkinson, Sheffield; J. F. Wild, Altencliffe; W. D. Allen, Sheffield; H. Allen, Sheffield; C. Allen, Sheffield; A. T. Hollingsworth, 35, Bedford-street; C. W. Wooseman, 32, Craven-street.

JONES AND EVANS (Limited).—Capital 6000*l.*, in shares of 10*l.* All or any of the businesses usually carried on by land companies in all their respective branches. The subscribers (who take one share each) are—J. Jones, Cheetham; W. H. Evans, Cheetham; L. Tatham, Manchester; J. Ridditwigh, Manchester; J. Law, Hulme; E. H. Westerman, Manchester; C. Greig, Manchester.

THE ZETLAND COMMERCIAL AND BUILDING SOCIETY (Unlimited Company).—The usual business connected with a building society, and to take over and carry on the business of a society bearing the same name. The subscribers are—J. B. Matthewman, Huddersfield; D. Swallow, Huddersfield; A. J. John, Huddersfield; B. Dyson, Huddersfield; A. Parkin, Huddersfield; F. Hirst, Huddersfield; A. Spur, Huddersfield.

THE RUABON SPELTER COMPANY (Limited).—Capital 30,000*l.*, in shares of 5*l.* To adopt and carry into effect a certain contract for the acquisition of the business carried on at Ruabon, county of Denbigh, by Messrs. Kendrick and Son, along with all plant, machinery, premises, &c., for the purpose of continuing the business of spelter manufacturers, and to purchase or otherwise acquire, develope, and work mines, minerals, and mining rights in England and Wales, rendering marketable, selling, and disposing of spelter, blende, and other minerals so acquired. The subscribers (who take one share each) are—E. W. Fraser, 4, Copthall Buildings, accountant; W. W. Alison, Acton, clerk; L. M'Intosh, 262, Goldhawk-road, clerk; E. Bryon, Ruabon, manufacturer; W. Thomas, Wrexham, J.P.; J. Eyton-Jones, Wrexham, M.D.; J. Kendrick, Ruabon, spelter manufacturer.

THE STAINLAND BUILDING AND COMMERCIAL SOCIETY (Unlimited Company).—The usual business and operations of a building society in all branches. The subscribers are—W. Hirst, Stainland; S. Whiteley, Stainland; A. Shane, Stainland; W. Harrison, Stainland; J. Haigh, Stainland; T. Briggs, Stainland; M. Eastwood, Stainland; E. Sykes, Stainland.

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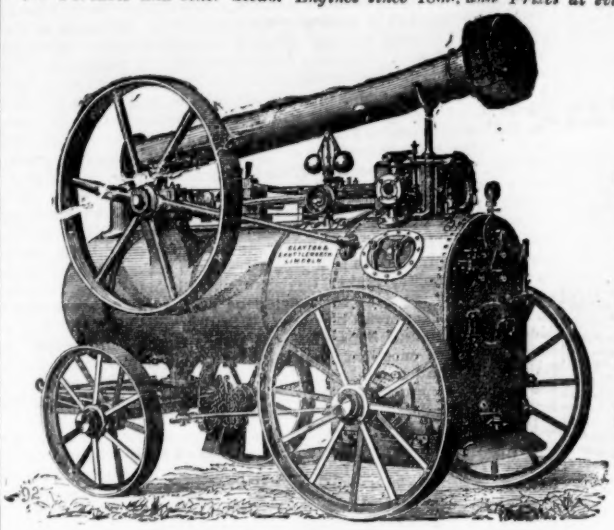

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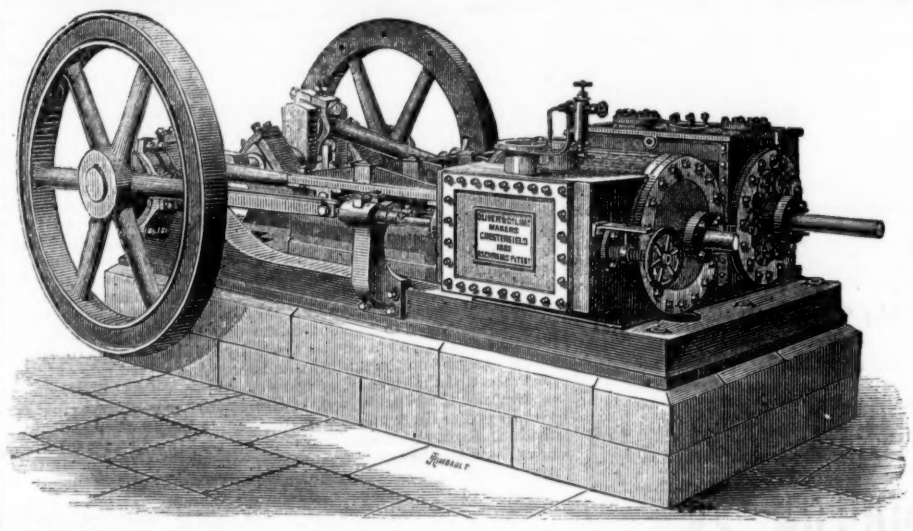

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In action it gives off neither flame, smoke, nor offensive smell By its use labour is economised, as work can be resumed immediately after the shot is fired.

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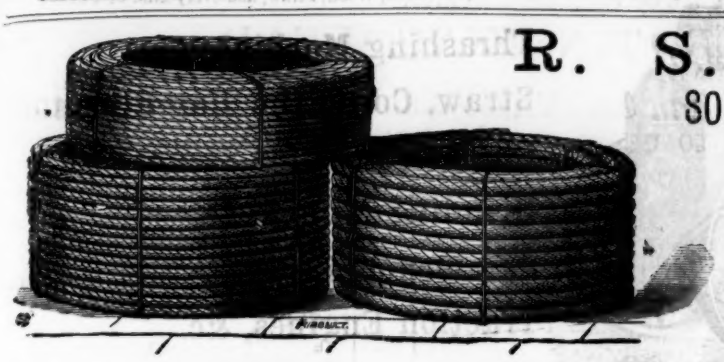

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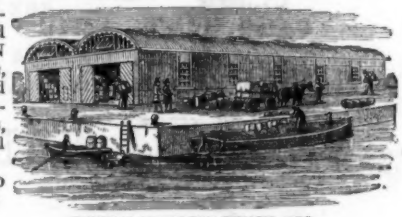

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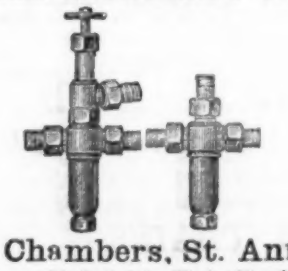

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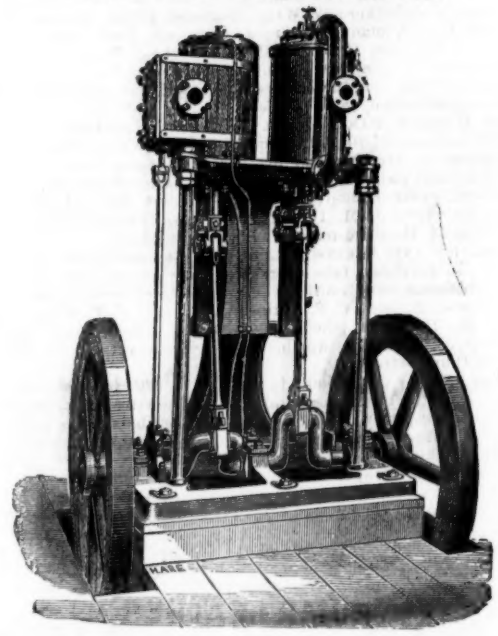
"Champion" Rock-borer

AND AIR COMPRESSOR.



The work performed by this machinery, through some of the hardest rock, proves its great value.

In Cornwall, irrespective of the work done by the "Champion" Rock-borers purchased by various Mines, the drivage, rising, stoping, and sinking on the proprietor's own contract work, amounts to over 1070 fathoms.

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This Wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, and yet work with equal efficiency through all variations of quantity down to a fifth, or even less if required. It is easily coupled to a steam-engine, and in this way always assists it by whatever amount of power the water is capable of giving, and therefore saves so much fuel.

This Turbine is applicable to all heights of fall. It works immersed in the tail-water, so that no part of the fall is lost, and the motion of the Wheel is not affected by floods or back-water.

References to places where it is at work will be given on application to—

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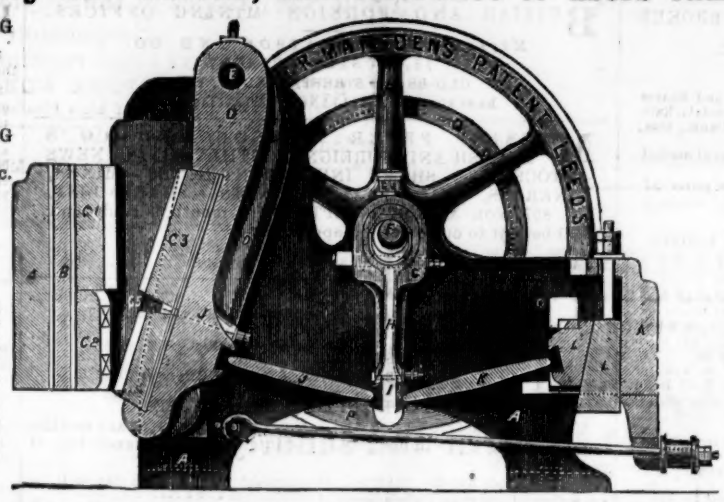
"I am sure the machine will be a success, and a great one, and there is any amount of demand for such a machine. We can work it with 20 lbs. of steam, and our engine, which is a 12-h.p., plays with the work, in fact we run the Stonebreaker and the Pulveriser both together with 35 lbs."



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Works: Oldfield Road, Salford, Manchester.

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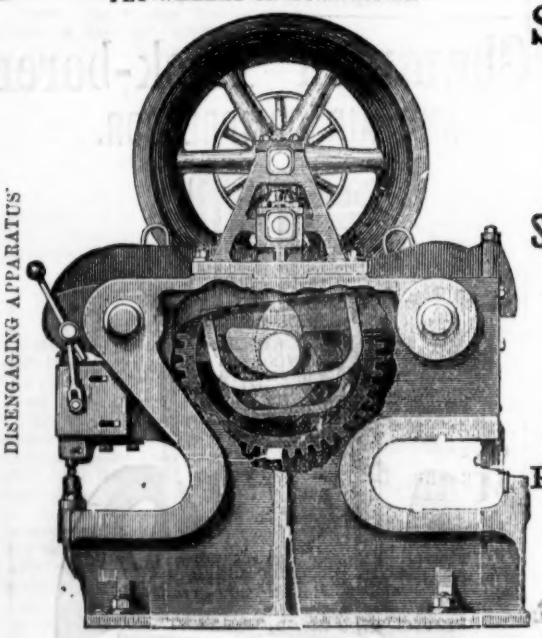

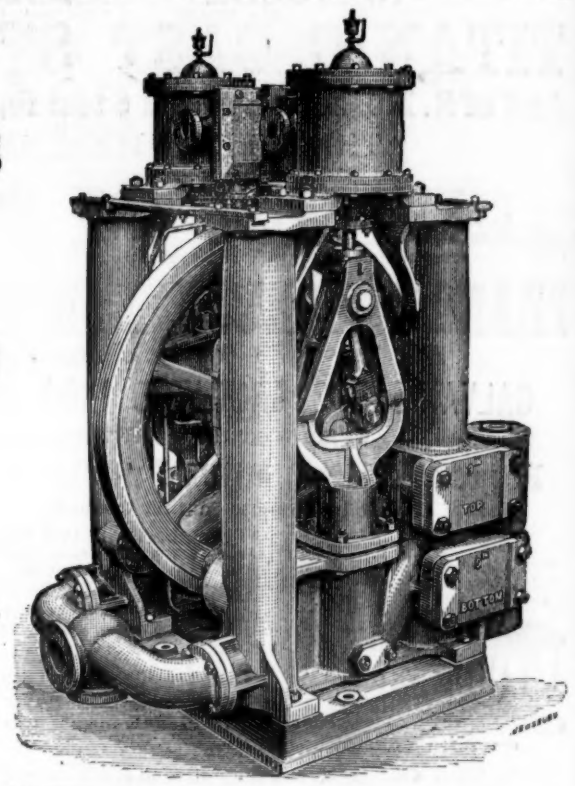

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LONG LANE, SOUTHWARK LONDON
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